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The Canadian Dental Association

JOURNAL

L'Association Dentaire Canadienne

JANUARY

JANVIER

1963

VOLUME 29

No. 1

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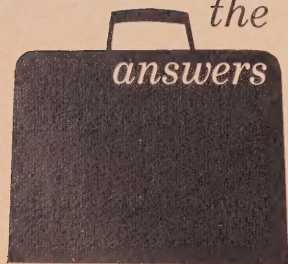
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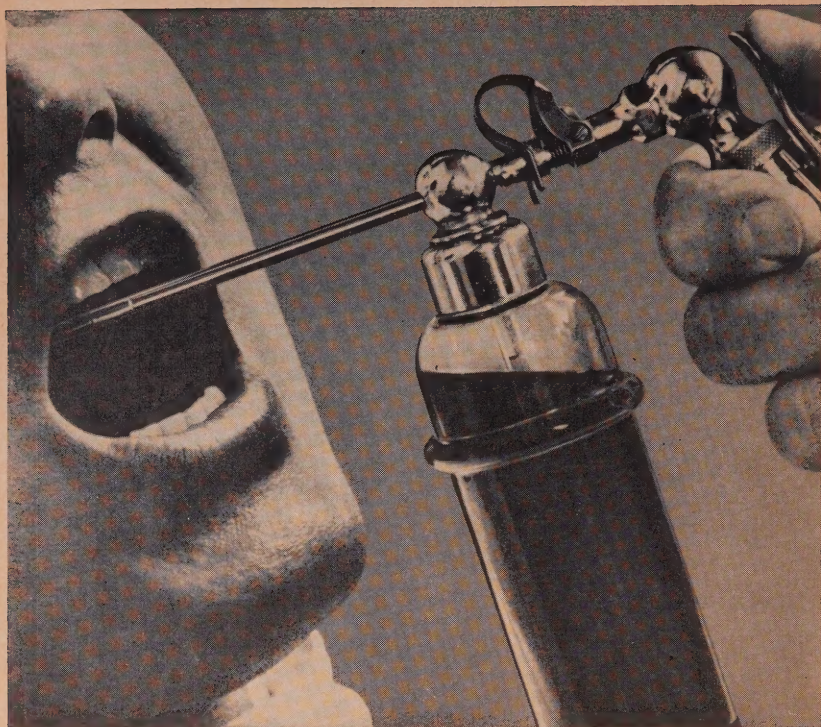
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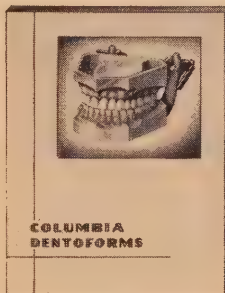
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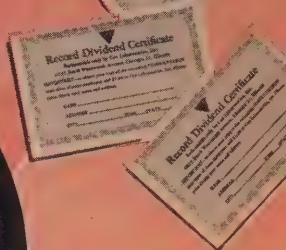
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All additions and changes of address should be sent to the Managing Director before the 20th of the month, to become effective the following month.

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The Canadian Dental Association

Volume 29

Number 1

Toronto

January 1963

JOURNAL

L'Association Dentaire Canadienne

Resuscitation in the dental office

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Every dentist should be prepared to meet respiratory and circulatory emergencies in his office. It is valuable for the dentist to have knowledge of resuscitation techniques, as the chance of a patient experiencing a cardiac attack in the dental chair is always a possibility, with the ever increasing number of cardiac and potential cardiac patients seen by dentists nowadays. Although respiratory arrest is not always a feature of so-called "heart attacks," it occurs in cases of cardiac arrest. In that event pulmonary ventilation must be started within seconds, and every dentist should know how

to breathe for a non-breathing person "without the use of equipment." Aids for more efficient ventilation such as S-shaped airways, nasal masks and full-face masks should be on hand, but the success of resuscitation depends upon immediate and adequate oxygenation usually performed with direct mouth-to-mouth breathing. An outline of resuscitation techniques, providing an open airway, pulmonary ventilation, and cardiac resuscitation is discussed.

The key to successful resuscitation is immediate oxygenation. A few effective inflations of the lungs are sometimes suf-

STEP (1) TILT HEAD BACK
HOLD JAW UP

PREFERRED

ALTERNATE



BLOW INTO MOUTH



OR SHUT LIPS-
BLOW INTO
NOSE



IF CHEST DOES NOT MOVE WITH STEP (1)...

STEP (2) HOLD JAW UP
BLOW INTO MOUTH



IN BABY BLOW GENTLY
INTO MOUTH AND NOSE



WHEN CHEST MOVES
TAKE YOUR MOUTH OFF
REPEAT EVERY 3-5
SECONDS...

FIGURE 1 Direct mouth-to-mouth and mouth-to-nose breathing. (After Safar and McMahon: Resuscitation of the Unconscious Victim; Charles C. Thomas.)

STEP (1) INSERT AIRWAY

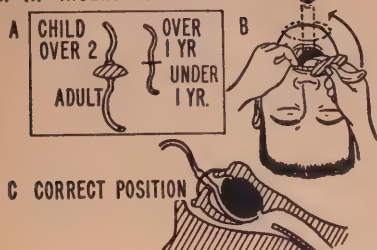
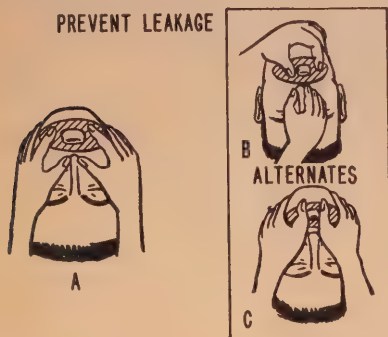
STEP (2) TILT HEAD BACK
PREVENT LEAKAGESTEP (3) BLOW FORCEFULLY
(IN BABY BLOW GENTLY)STEP (4) WHEN CHEST MOVES TAKE YOUR
MOUTH OFF
REPEAT EVERY 2-5 SEC.

FIGURE 2 Mouth-to-oro-pharyngeal airway breathing. (After Safar and McMahon: Resuscitation of the Unconscious Victim; Charles C. Thomas.)

ficient to restore failing circulation ^{1,2} (Figure 1). Exhaled air resuscitation or mouth-to-mouth breathing, with or without the use of adjuncts, should therefore be learned by all dentists.

Once an emergency arises, it is usually too late to think about what should be done. It has been found that along with clinical experience in resuscitation under supervision, a step-by-step outline helps in instituting rapid action in case of a respiratory or circulatory emergency. The following steps should be taken:

1. Provide an open airway. Put the patient in the face-up position, tilt his head

back and hold his mandible forward to prevent pharyngeal obstruction by the tongue. If necessary insert an artificial oro-pharyngeal airway ³ (Figure 2, Step 1).

2. If there are no breathing movements start mouth-to-mouth breathing. Use the S-shaped mouth-to-mouth airway,* if it is immediately available, but do not waste time looking for it. If a bag-mask unit with an anaesthesia machine or an oxygen cylinder is available, another person should get it ready while the dentist per-

* Resuscitube, Johnson & Johnson.

forms mouth-to-mouth and mouth-to-airway breathing. Inexperienced personnel usually have more difficulty with the use of bag and mask than with mouth-to-mouth and mouth-to-airway breathing. It is not easy to provide a tight mask fit and support the patient's head and mandible with one hand.

3. If the dentist is unable to inflate the patient's lungs, he should check for the pressure of foreign matter in the pharynx. If there is solid foreign matter in the pharynx, suction equipment usually becomes obstructed. If it does, clear the pharynx with the fingers or a piece of cloth.⁴

4. If there is still obstruction, it is probably caused by laryngospasm. Laryngospasm can often be successfully treated by an increase of inflation pressure. If this fails, perform orotracheal intubation or tracheotomy, but only if experience has been obtained in these two techniques. Then inflate the lungs by blowing intermittently into the tube.⁵ Blind nasotracheal intubation is not suitable for resuscitation, since several attempts may be necessary and valuable time may be lost. Try first to inflate the lungs without a tracheal tube as this is usually successful in providing adequate oxygenation. Cardiac arrest has occurred in asphyxiated patients during prolonged attempts at tracheal intubation or tracheotomy when reoxygenation could have been accomplished by use of mouth-to-mouth or bag-mask technique.

5. If after a few lung inflations the patient is still apnoeic, and a pulse cannot be felt in the carotid artery, press the sternum forcefully and repeatedly against the patient's back, between lung inflations. This form of "closed chest cardiac massage" may squeeze the heart sufficiently between the sternum and the vertebral column to move blood (Figure 3). If the accident occurs in the hospital and if a competent assistant is present, "open chest cardiac massage" is indicated only after attempting closed chest cardiac



FIGURE 3 Closed chest cardiac massage. (After Safar and McMahon: Resuscitation of the Unconscious Victim; Charles C. Thomas.)

massage for five minutes without success. "Open chest cardiac massage" should not be attempted in the dental office, unless the practitioner is surgically trained and equipment for haemostasis and closure of the chest is available.

6. If the patient is breathing adequately, but his blood pressure is low (usually manifested by cold clammy skin, pallor and a weak thready pulse) inject intravenously a vasopressor drug and place him in a supine position with the head lowered.

7. In the case of convulsions or a patient with epilepsy, the first thought should be to provide adequate pulmonary ventilation; the second to inject intra-

venously a small dose of a short-acting barbiturate. Every dental office should be equipped for the performance of venepuncture but if a vein cannot be entered successfully, injection of the emergency drug in the soft tissues of the floor of the mouth will produce a rapid effect due to the vascularity of that area.

8. If cardiac arrest has occurred and if the dentist is successful in maintaining sufficient blood flow and oxygenation by the methods described to maintain vital function, the patient is still not out of danger, as ventricular fibrillation almost always intervenes and appropriate electrical equipment is needed to bring a heart out of fibrillation. While the dentist and his assistant are keeping the patient alive, a third party should telephone the hospital (1) explaining that a case of cardiac arrest is on hand, (2) requesting an ambulance, and (3) alerting the hospital to stand by, and be prepared to treat the patient on arrival. Oxygenation and cardiac massage must be continued all the way to the hospital.

SUMMARY

As the above outline illustrates, being prepared for modern resuscitation requires a minimum of equipment and drugs. The dentist's skill and judgement and his practical experience in the management of unconscious patients are more important than expensive and elaborate resuscitation equipment.

RÉSUMÉ

Le dentiste doit être en mesure de parer aux urgences amenées par des désordres respiratoires et cardiaques. Il suffit parfois d'amorcer quelques inspirations des poumons pour rétablir une circulation défaillante (Figure 1). Tous les dentistes doivent donc connaître les méthodes pour ranimer un patient, soit par l'air exhalé, soit par la respiration de bouche à bouche.

Les lignes qui suivent décrivent des façons d'agir rapidement dans un cas d'urgence respiratoire ou circulatoire.

1. *Dégager les voies respiratoires supérieures. Placer le patient sur le dos, pencher la tête en arrière et tirer sa mandibule en avant pour prévenir l'obstruction de son pharynx par la langue. Si nécessaire, enfoncer un appareil bucco-pharyngien pour permettre à l'air de passer (Figure 2, phase 1).*

2. *S'il n'y a pas de signe de respiration, commencer tout de suite la respiration de bouche à bouche. Utiliser, pour ce faire, l'appareil en forme de S,* s'il est immédiatement disponible, mais ne pas perdre de temps à le chercher. S'il y a dans le cabinet un appareil à anesthésie muni d'un masque et d'un cylindre d'oxygène, l'assistante ou une autre personne doit le préparer pendant que le dentiste pratique la respiration de bouche à bouche. Les gens peu familiers avec l'appareil d'anesthésie auront plus de succès avec la respiration de bouche à bouche ou avec l'appareil à cet effet, car il n'est pas facile d'ajuster le masque d'une façon hermétique et de retenir la tête et la mandibule du patient d'une seule main.*

3. *Si le dentiste ne peut pas insuffler les poumons du patient, il devrait vérifier s'il n'y a pas de corps étranger dans le pharynx. Il y a une obstruction du pharynx si l'aspirateur se bloque quand on l'y enfonce. Si c'est le cas, il faut nettoyer le pharynx avec les doigts ou une gaze.*

4. *Si le pharynx reste bloqué, il y a probablement un spasme à cet endroit. On peut souvent soulager un spasme du larynx en accentuant la pression pour insuffler les poumons. Si cette façon de faire ne donne rien, il faut faire une intubation oro-trachéale ou une trachéotomie, si on est au courant de cette intervention. En-*

* Resuscitube, Johnson & Johnson.

suite, insuffler les poumons en soufflant de temps en temps dans le tube. Une intubation naso-trachéale à l'aveuglette n'est pas indiquée pour ressusciter un patient, car cette technique ne réussit pas toujours à la première tentative et on perd un temps précieux. Tenter d'abord d'insuffler les poumons sans tube trachéal, car cette méthode suffit ordinairement à créer une oxygénation suffisante. Le coeur est susceptible de s'arrêter chez un patient asphyxié pour qui on tente d'insérer un tube dans la trachée ou de pratiquer une trachéotomie, quand on aurait pu tout simplement le ranimer par la respiration de bouche à bouche ou en lui donnant de l'oxygène sous pression.

5. Si, après quelques insufflations des poumons, le patient est encore inanimé et n'a pas de pouls (artère carotide), pousser avec force et d'une façon répétée le sternum en direction de la colonne, entre les insufflations. Cette technique du "massage interne du coeur" peut compresser suffisamment le coeur pour accélérer la circulation (Figure 3). Si l'accident se produit à l'hôpital et qu'il y a là un assistant entraîné, pratiquer le "massage externe du coeur," si le massage interne n'a pas donné de résultat. Le "massage externe du coeur" ne doit pas se faire dans un cabinet dentaire, à moins que l'opérateur soit familier avec la chirurgie et qu'il ait à sa disposition le matériel pour l'hémostase et la fermeture de la poitrine.

6. Si le patient respire bien, mais si sa pression artérielle est basse (peau moite, froide et pâle, pouls faible et filant), injecter dans une veine un stimulant et coucher le patient en lui plaçant la tête basse.

7. Si le patient fait des convulsions ou s'il souffre d'épilepsie, il faudrait songer

à le faire bien respirer; ensuite lui injecter dans une veine une petite dose de barbiturique de courte durée. Tout cabinet dentaire devrait avoir l'appareillage nécessaire pour une injection intra-veineuse; mais, si la veine se localise difficilement, un médicament d'urgence peut s'injecter dans le plancher de la bouche; le médicament agit rapidement à cause de la vascularité de cette région.

8. Si le coeur est arrêté et si le dentiste, grâce aux techniques indiquées, a pu maintenir à un niveau suffisant l'oxygénation pour maintenir la vie du patient, cela ne veut pas dire que celui-ci est hors de danger: il pourrait alors se produire une fibrillation ventriculaire qui doit être arrêtée par un appareil électrique approprié. Pendant que le dentiste et son assistante maintiennent la vie du patient, une troisième personne devrait téléphoner à un hôpital et dire (1) qu'il s'agit d'un arrêt cardiaque; (2) qu'il faut envoyer d'urgence une ambulance; (3) qu'il faut qu'on s'y prépare à recevoir le patient et s'en occuper dès son arrivée. L'oxygénation et les massages cardiaques doivent être continués durant le transport à l'hôpital.

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158 St. George Street

Study of carcinoma of the oral cavity

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Cancer, a major world-wide problem in public health, is no respecter of age, race or social position. Cancer of all types strikes on the average of one in every two homes. Among fatal diseases, it ranks second to heart ailments.¹ Yet of all major causes of death in America, cancer is one of the most curable — provided treatment begins soon enough; here lies the dentist's responsibility.

Each year there are close to 25,000 cases of oral malignancy in the United States. This represents approximately five per cent of all cancers. Of these, as will be discussed later in this paper, the practicing dentist sees 7,000 to 8,000 cases, or thirty-five per cent of all oral carcinomas.² It is with these thought-provoking and shocking facts in mind that the dentist must educate and equip himself to contribute to the diagnosis and possible treatment of oral carcinoma.

The following article is based on research conducted at Mercy Hospital, Baltimore, Maryland, Perry Point Veterans Hospital, Perry Point, Maryland and a review of the literature.

DEFINITION OF TERMS

Neoplasm.—Neoplasm means new growth; it is a synonym for tumour. It may be either benign or malignant. It should be differentiated from hyperplasia, which is an abnormal multiplication of normal cells. Neoplastic cells grow independently of the rest of the body cells and generally show signs of anaplasia, a loss of differentiation of cell type.

Malignancy.—Malignancy actually means to go from bad to worse. Malignant tumours show certain characteristics which demonstrate this progress. They are: (a) wild rapid growth; (b) invasion because of non-encapsulation; and (c) spread by metastasis.

Carcinoma.—Carcinoma is a malignant tumour of epithelial cell origin. It accounts for approximately 90 per cent of all oral malignancy.

Primary Lesion.—Primary lesion is the original tumour. It is from this lesion that the carcinoma invades and metastasizes.

Secondary Lesion.—Secondary lesion is a malignant lesion that has spread from a primary lesion. It is the same cell type. It may be single or multiple. It is a result of metastasis and in this respect the secondary growth acts like a primary lesion.

Metastasis.—Metastasis is the transfer of the cancer cells from one part of the body to another without being directly connected to it. The most common route of transfer of squamous-cell carcinoma is by way of the lymphatic system. Malignant cells invade lymph channels, are dislodged and carried by the lymph to other tissues where they become new independent growths.

THE DENTIST'S RESPONSIBILITY

High Index of Suspicion.—Through newspaper articles, television, radio, and other news media, the general public is being educated and made more conscious of the

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importance of early diagnosis in the treatment of cancer. Because of this fact they have become "cancer conscious" and are presenting themselves for examination earlier than ever before. This popular interest presents a real challenge to the dentist for diagnosis and his index of suspicion of oral carcinoma should be higher than ever before.

Eighty per cent of all untreated oral carcinoma patients are dead eighteen months after discovery of the disease.² With such a rapid progressing disease, early diagnosis is the most important single factor. The dentist's suspicion should be so great that every questionable lesion in the patient's mouth should bring to his mind first the thought of cancer, and he should attempt to rule out this fact immediately. There are few efforts of endeavour by the dentist that have a direct bearing on the saving of a patient's life. Early diagnosis of oral carcinoma gives him the greatest opportunity to save lives and he must be prepared to accept this responsibility.

Next to the patient himself, the dentist is the first line of defence against oral carcinoma. Patients with gingival lesions visit their dentist first rather than their physician by a ratio of better than seven to two.² The oral cavity is the dentist's domain and so it is his duty to become an expert in diagnosing oral lesions.

The dentist must carefully inspect the oral cavity. This inspection should be the first requirement of patient examination regardless of the reason for presentation. This inspection should include examination of the buccal mucosa, tongue, palate, floor of the mouth, faucial pillars, third molar crypts and other more accessible regions of the mouth. Since squamous-cell carcinoma is more prevalent in the late middle to old age range, it is recommended to routinely examine not only visually but also digitally all patients over forty years whether lesions are present or not.

Biopsy.—Biopsy is the only positive way to diagnose cancer and should be a man-

datory procedure whenever malignancy is suspected. Cancer is an emergency disease—emergency methods must be employed. Contrary to the layman's opinion, biopsy does not spread the growth. There is no contra-indication to biopsy. If the dentist does not wish to take the biopsy himself, it then becomes his duty to see that the patient is properly referred to someone who will perform it immediately.

The dentist's index of suspicion should be so great that a large percentage of his biopsy reports will be negative.

THE LESION

Gross Appearance

Lip.—Carcinoma of the lip is the most common oral malignancy. Its behaviour is more closely related to cancer of the skin than to cancer of the mucous membrane. It is easier to diagnose than any other oral cancer. The lesion usually occurs on the vermillion surface equidistant from the midline and buccal commissure on the lower lip.

The early clinical stage appears to be an innocent looking blister or an induration that is so slight that it is difficult to detect. In this early stage it may be mistaken for a cold sore or an innocuous fissure and is usually painless. As growth increases, ulceration and induration become more apparent, secondary infection is responsible for pain, and the diagnosis becomes easier.

Carcinoma of the lip, like other squamous-cell carcinomas, may be classified into two general types: (1) exophytic which, although it does infiltrate into the lip, is characterized primarily by a prominent outgrowing fungating growth the surface of which is ulcerated and secondarily infected; and (2) endophytic, which has a smaller sharply punched-out ulcerative area with infiltration into the depth of the lip.

Enlarged submental and submandibular lymph nodes—evidence of metastasis—occur in both types.

Tongue.—Carcinoma here begins as a painless superficially indurated ulcer with slightly raised borders and then proceeds into a fungating exophytic mass or infiltrates into the deep layers producing fixation of the tongue and induration without much surface change. Leucoplakia is the most common precursor lesion in carcinoma of the tongue, and its presence should warrant a closer examination of the tongue and surrounding tissue by the dentist.

Lesions near the base of the tongue are particularly insidious since they are asymptomatic until quite advanced and then usually present the manifestation of fixation of the tongue. Other symptoms that may appear are a sore throat, difficulty in swallowing, and enlarged cervical nodes.

Gingiva.—Squamous-cell carcinoma of the gingiva is one of the most important groups because it is one of those most easily misdiagnosed. Grossly it may mimic periodontal diseases, granular erosions, and leucoplakia.

The mandibular arch is affected more than the maxillary arch. It usually arises in the molar or bicuspid region. It is usually manifested first as a non-healing area of ulceration and erosion. It may be either an exophytic or endophytic type of growth.

Traumatic ulcers and hyperplastic tissue resulting from chronic irritation from ill-fitting dentures should always arouse suspicion in the dentist's mind, and should these not respond readily to treatment in a few days, the possibility of carcinoma should be considered.

Carcinoma of the gingiva often invades the underlying bone early giving radiographic evidence. The incidence of metastasis is quite high.

Hard and Soft Palate.—Carcinoma of the hard palate often begins as a small ulcerated area that tends to bleed and will not heal. It is usually well differentiated, and invasion of bone and maxillary sinus oc-

curs in the later stages. Ulceration is generally present, but it may also appear as a wart-like non-ulcerated grey mass that is firm and fixed to the palate.

In the edentulous patient, frequently the first symptom may be the inability to retain or wear the upper denture.

Tumours of the soft palate may be of the exophytic or endophytic type. They are usually typical for each type, the exophytic having an irregular surface and spreading superficially and the endophytic type a punched-out ulcer and indurated margins. Pain and dysphagia may be symptoms of soft palate cancer.

Buccal Mucosa.—Squamous-cell carcinoma of the buccal mucosa is found most commonly opposite the third molars and along the middle of the buccal mucosa where it contacts the teeth. The early lesion presents few symptoms, but as ulceration and secondary infection occur it becomes painful, and fixed to the deeper tissues. Areas of leucoplakia should be watched for fissuring or any malignant change. Metastasis is relatively high.

Floor of the Mouth.—Carcinoma of the floor of the mouth generally starts just at either side of the midline near Wharton's papillae. It often grows peripherally to invade the mandible by direct extension, or it may grow centrally under the surface of the tongue.

It is frequently discovered as an induration which is felt by the tongue. As the lesion ulcerates and grows larger, it invades the fraenum of the tongue, and pain on movement of the tongue may be a prominent symptom. The metastatic rate here is high.

Histological Appearance

Squamous-cell carcinoma of the oral cavity in general tends to be a moderately well differentiated neoplasm. Highly anaplastic lesions do occur but they are rare; such lesions tend to metastasize early and widely and cause death quickly.

The well differentiated lesion consists of squamous epithelium arranged in sheets and nests of cells scattered throughout the lesion. There is no basement membrane. The cells are generally large and show a distinct cell membrane. The nuclei are large and hyperchromatic. Mitotic figures may be present but do not appear to be numerous. The most prominent feature is individual cell keratinization and the formation of numerous epithelial pearls of various size. The sub-epithelial connective tissue is usually infiltrated heavily with inflammatory cells of the chronic type.

In the highly anaplastic lesion the neoplastic cells bear little resemblance to the original tumour cells. They are arranged in a more or less uniformly dense pattern and show great amounts of polychromatic and hyperchromatic nuclei. Mitotic figures are very numerous. There is no keratin formation from these primitive cells.

The most common system of grading tumours was initiated by Broders.³ This system of grading assigns the highly differentiated lesion (slightly anaplastic) to Grade I and the very poorly differentiated lesion (high anaplastic) to Grade IV. The advantage of grading a tumour is that the grade reflects the anaplasticity of the lesion, and this in turn indicates the general rapidity of growth, rapidity of metastatic spread and general reaction following radiation and the prognosis. There is, however, a major shortcoming of tumour grading in that any one individual tumour may exhibit various degrees of anaplasia and therefore varying degrees of malignancy.

INCIDENCE

Age.—Oral carcinoma is primarily a disease that attacks the middle or advanced aged individual. In our study of sixty-two cases, the average (mean) age was fifty-seven years old; however, this is not a disease exclusively of the elderly as al-

TABLE 1 Incidence by age of oral cancer.

Age group	No. of cases	Per cent
25-34	3	4.8
35-44	10	16.1
45-54	9	14.5
55-64	20	32.2
65-74	17	27.4
75-84	3	4.8

most five per cent of the cases studied were between the ages of twenty-five and thirty-four. The mode fell in the fifty-five to sixty-four year group, accounting for thirty-two per cent of all cases.

This compares favourably to the work of Castigliano, who reports the disease most common in people sixty to sixty-five years old.²

Sex.—Squamous-cell carcinoma as an entity attacks mainly the male, but not exclusively. The studies at Perry Point Veterans Hospital did not allow us to evaluate this point, as the vast majority of the patients there are male. Shedd, Schmidt, and Chang report on ninety-one patients of which only fifteen were female (16 per cent).⁴

Smith's extensive studies show this figure to be high as the occurrence in women is less than ten per cent in the United States. In Europe, where lipstick is not worn as universally as here, cancer of the lip in women is almost equal to that of men.⁵

Race.—The Caucasian appears to have a predisposition to oral carcinoma as compared to the Negro. Only five (8 per cent) of the cases studied were Negroes. Smith reports Negro incidence of six, twenty-five and thirty per cent in studies of the lip, buccal mucosa and tongue, respectively.⁵

Anatomical Areas.—Of the soft tissue lesions that the dentist encounters in his

TABLE 2 Relative frequency of malignancy.²

Site	No. of cases	Perry Point per cent	Castigliano per cent
Lip	17	27.4	34.5
Tongue	21	33.9	24.8
Tonsil	7	11.1	9.4
Palate	2	3.2	11.4
Buccal mucosa	6	9.7	5.9
Floor of mouth	7	11.1	5.0
Gingiva	3	4.8	10.0

practice, oral malignancy accounts for approximately six per cent.² The lip and the tongue are the most frequent sites of occurrence, making up over fifty per cent of all cases of oral squamous-cell carcinoma. In our studies, tongue malignancies occurred most frequently, accounting for thirty-four per cent of all cases. Out of twenty-one occurrences, fourteen were on the lateral surfaces, five on the posterior tongue and two on the ventral surface. Smith reported in his studies thirty-five to forty-five per cent of all oral tumours appear on the tongue; of these, seventy per cent appeared on the lateral surfaces.⁶ Englert reports the same findings and claims that this organ undergoes early metastasis to the sub-digastric lymph nodes.⁷

The lip, according to our study, was the second most frequent site of occurrence, accounting for twenty-seven per cent of the cases. In many studies it is the most frequently occurring site of oral carcinoma. In all seventeen cases the lower lip was affected, the lesion occurring most commonly half-way between the midline and the oral commissure on the vermilion border. Of six hundred cases studied by Smith, only twenty-two were of the upper lip and only sixty cases were found in women.⁵

Tonsillar carcinoma appeared in eleven per cent of the cases, which compares favorably to Castigliano's study of nine per cent.² The tumour's usual location is between the anterior and posterior

fauces and shows early metastasis in seventy per cent of the cases to the cervical lymph nodes.

Of the sixty-two cases studied, only two (3 per cent) were discovered on the palate, both of which were on the soft palate. Smith reports a more frequent occurrence of eight per cent and Castigliano, of eleven per cent.^{2,6} In general tumours of the palate appear on the soft palate three times more frequently than on the hard palate, and those of the hard palate are normally of the mixed salivary type and not squamous-cell.²

Carcinoma of the buccal mucosa appeared usually near the occlusal line, close to the middle one-third of the cheeks, and accounts for ten per cent of the cases. Castigliano and Smith report frequencies between five and ten per cent.^{2,5}

Gingival carcinoma appeared in three cases (4.8 per cent), and all three were located on the lower jaw between the second bicuspid and second molar area. Smith reports a more frequent occurrence of carcinoma in this location, placing the mode between twenty and twenty-five per cent.⁵ Other studies place the value between five and fifteen per cent and occurring in the lower jaw sixty per cent of the time.²

Using the Perry Point Hospital records we recorded seven (11 per cent) cases occurring on the floor of the mouth; however, it was difficult to ascertain in five of the cases if the cancerous growth's

primary site was not in reality the ventral surface of the tongue or the lingual surface of the gingiva. The reported occurrence of carcinoma in this area is about five per cent, usually occurring on either side of the midline near Wharton's papillae.²

PREDISPOSING FACTORS

The aetiology of cancer has been and is being studied today at great expense and time by our most eminent scientists. The exact causative agent of malignant degeneration has not yet been revealed. There are, however, certain circumstances that appear too frequently in conjunction with oral carcinoma to be dismissed as mere coincidence. Among the many factors considered as possible predisposing agents of cancerous change are tobacco, alcohol, poor oral hygiene, solar ray exposure, trauma, hyperkeratosis, syphilis, vitamin deficiencies and hormone dysfunctions.²

Trieger introduces an interesting theory of cocarcinogenesis in the development of oral malignancies, placing much of the blame upon alcohol.⁸ He proposes that a conditioned mucosal substrate exists in certain persons who are experiencing liver dysfunction due to the high alcoholic intake. This substrate then reacts to superimposed carcinogens and irritants—such as chronic irritation, tobacco or trauma—by undergoing malignant degeneration.

He found in one of his studies that seventy-six per cent of his patients with tongue cancer had consumed in excess of six "shots" a day and forty-eight per cent had equivocal evidence of hepatic cirrhosis. An additional six per cent had histories which included yellow atrophy of the liver and benzol, naphtha and cinco-phen toxicities.⁹ In another of Trieger's studies made a year later, fifty-nine per cent of his patients with cancer of the floor of the mouth, palate and tonsillar fossa had overt hepatic cirrhosis. He concluded that the local effect of alcohol on

the mucosa is of lesser importance and is secondary to the generalized change in the mucosal substrate. This conclusion was based upon a study of a group of non-alcoholic cirrhotics with carcinoma of the mouth.⁸

With a smaller sampling at Perry Point and Mercy Hospitals it was discovered that thirty-nine per cent of the patients with oral carcinoma gave a history of heavy alcoholic consumption. This compares favourably with Wyneder's figure of thirty-three per cent.¹⁰

Tobacco has been under extensive investigation as a possible aetiological agent in cancer. Hertz reports that ninety-eight per cent of oral cancer patients are smokers and the cellular degeneration is due to a combination of heat and substances in the tobacco, such as dibenzpyrine.¹¹

Smith reports, of one hundred twenty-nine patients he studied, one hundred and nine used tobacco in one form or another.⁵ In our own survey, only fifty per cent of the cases were found to be tobacco users; however, this low figure may be due to the inaccuracies in the case histories and not due to the actual low incidence of use.

Kreshover and Salley, in attempting to establish a direct relationship of tobacco with carcinomatous change, placed tobacco on the gingival tissues of rabbits. In twenty-five days leucokeratotic lesions appeared, but no malignancies. In further experiments they were successful in inducing malignant degeneration of hamster ears in response to tobacco. The inducement of vitamin deficiencies "A" and "B" increased the tissue response to the irritant, indicating a vitamin or substrate relationship. They carried the experiments one step further by using gonadectomized animals which showed a decreased severity of reaction to both tobacco and vitamin deficiencies.¹²

Trieger, too, feels that a possible deficiency or alteration in sex hormones might evoke a substrate change that renders the patient more susceptible to the development of mucosal cancer.¹³ Cholesterol, the chemical source of steroids which bears a close resemblance to

TABLE 3 Possible predisposing factors in oral malignant degeneration.

Agent	Times found	Percentage
Alcohol	24	39
Smoking	31	50
Poor oral hygiene	12	19
Outdoor occupation	21	34
Trauma	15	24
Dentures	8	13
Hyperkeratosis	21	34
Syphilis (tongue cases)	3	14
Hereditiy	4	6

known carcinogens, has been indicted. Bernier claims that abnormalities in the metabolism of the steroids may apparently precede by months or years the appearance of malignant change.¹⁴

Chronic irritation and trauma are believed to be strong predisposing factors in the development of oral cancer. Twenty-four per cent of the cases studied had a history of trauma, and an additional eight per cent showed irritation from dentures, ragged teeth, gold crowns and lingual bars of partial dentures. Of interest, two patients reported bee stings on their lips prior to the development of the malignant lesion. Nineteen per cent of the patients were reported as having "very bad oral hygiene" which may have further acted as chronic irritation. Trieger, in his studies, reported that seventy per cent of his patients had shown long-standing oral irritation in the form of sharply broken eroded teeth or poorly fitted dentures.¹³

Solar rays and the exposure to the weather have often been implicated in carcinoma of the lip. Eighty-two per cent of the cases with lip cancer had occupations which exposed them to the outdoors for long periods of time. Outdoor occupations were found in thirty-four per cent of all oral carcinoma patients; an additional eleven per cent were employed in jobs that exposed them to high temperatures for prolonged periods—such as iron and steel workers. Blumlein re-

ports that sixteen per cent of the patients he studied with oral laryngeal cancer had occupational exposure to extreme heat; he feels that prolonged inhalation of hot air and harmful chemical substances appears to be the main factor in the aetiology of oral cancer.¹⁵

A past history of syphilis with interstitial keratosis of the tongue often precedes malignant degeneration of that organ. Five per cent of the average white population has syphilis, yet twenty to thirty per cent of the patients with cancer of the tongue have chronic syphilis.² Smith reports that syphilis appears five times more frequently in cancer of the tongue than in any other carcinoma.⁶ Hertz and Trieger both report that eighteen per cent of patients with carcinoma of the tongue show a positive Wassermann reaction.^{11,13} In our study, it was found that fourteen per cent of the patients with glosso-carcinoma had syphilis. A positive serological test was not obtained from any patient with oral carcinoma elsewhere.

Hyperkeratosis presents a problem in diagnosis of oral carcinoma and the establishment of an aetiological relationship. The keratotic plaque may undergo malignant degeneration in a very subtle way and ultimately cause the death of the patient. In thirty-four per cent of the cases studied, hyperkeratosis was present in conjunction with the malignant lesion; some of these were originally misdiagnosed clinically as "leucoplakia"—and as such benign. Biopsy of suspicious keratotic lesions is the only rational method of diagnosis possible. Smith reports in a variety of studies that "oral leucoplakia" accompanied oral carcinoma in three to twenty-eight per cent of all cases.⁵

Hereditary predisposition to cancerous change assumes minor importance, if any, in most writings. A survey of the current literature failed to find a single word on the subject. Of the sixty-two cases studied only four (6 per cent) of the histories showed a parent who had cancer, or died from cancer of any anatomical area.

Until further research is accomplished, it appears a safe assumption that oral carcinoma is due to a number of aetiological factors, both intrinsic and extrinsic, acting simultaneously to produce the malignant degeneration. It is the responsibility of the dentist to maintain a high index of suspicion of any lesion on the soft tissues when a causative agent cannot be established.

DIAGNOSIS

The diagnosis of squamous-cell carcinoma is probably the most serious task in a dentist's practice. As was mentioned earlier, the dentists of the United States see 7,000 to 8,000 cases a year, thirty-five per cent of all oral malignancies. The practitioner will often encounter pre-malignant lesions—these refer to changes in the tissues which may assume the character of malignant growth, but may remain quiescent for a long period of time, particularly when not exposed to irritation. It is these lesions he must watch with particular surveillance — hyperkeratosis, chronic ulcers, recurrent papillomas, and chronic epithelial hyperplasia.¹¹ The only definitive diagnostic test at this time in the hands of the physician and dentist is biopsy, immediate and correct.

Hertz reports that between twenty-seven and sixty-five per cent of patients with oral cancer see their dentists before their physician. Of those patients with lesions of the gingiva, sixty-five per cent sought the dentist's aid first; of the palate—forty-five per cent; the tongue—thirty-five per cent; buccal mucosa—thirty-five per cent; and the floor of the mouth—twenty-seven per cent. Of these, forty-four per cent were recognized by the dentist, and an average of three weeks passed before the patient presented himself to a physician for treatment. In the remaining fifty-six per cent not recognized by the dentist, seven months passed until the patient sought his physician.

In our hospital survey twenty-six per cent of the patients with oral carcinoma

TABLE 4 Chief presenting complaints.

Complaints	Number	Per cent
None	16	26
Dysphagia	12	20
Non-healing lesion	11	18
Pain	8	13
Bleeding	5	8
Thickening and pruritus	4	6
Weight loss	3	5
Sore throat	2	3

had no previous knowledge of any irregularities existing and were diagnosed on a routine physical examination. Only two cases, of sixty-two, were picked up by a dentist. The most frequent complaining symptom recognized by the patient was a chronic dysphagia, presenting itself in twenty per cent of all histories. However, this was almost exclusively confined to tonsillar and tongue carcinomas. The second most frequent symptom was the presence of a non-healing indolent lesion in eighteen per cent of the cases. The duration of the lesion ranged from two weeks to ten years. Pain was present in only thirteen per cent of the cases, never severe pain except in the terminal stages of the disease, indicating once again that early diagnosis of carcinoma can be successfully met only by alert routine oral examinations.

Smith, in his extensive work on oral carcinoma, computed the average elapsed time between the patient's first noticing that some abnormality existed, either objective or subjective, and his presentation of himself for treatment. In carcinoma of the lips, the delay in treatment time from complaint to treatment presentation was nineteen months, indicating the lack of symptoms. With malignancy of the buccal mucosa the time elapsed was fourteen months, the same as that for the palate. In carcinoma of the gingiva the time elapsed was shorter—nine months. The lesions of the tongue, perhaps because of their easy visualization and interference with mobility were reported

to have the shortest delay in treatment time—four months.⁶

The early diagnosis of oral carcinoma is not an easy accomplishment, as the first signs in thirty to forty per cent of all cases of the posterior mouth are painless, metastatic cervical lymph nodes.¹⁶ Of prime importance in diagnosis is the establishment of chronicity of the lesion; however, the patient will often lie and say a lesion has just appeared two days ago when in reality it has existed for three months. The presence of any small progressive lesion that does not react to recognized treatments should immediately arouse the dentist's suspicion. Any lesion on visual inspection and digital palpation that is painless and indurated should be biopsied without delay. The presence of ulceration and/or fissuring on a hyperkeratotic plaque, with or without induration, indicates the possibility of malignant degeneration. There is only one way to make a definitive diagnosis and that is biopsy. It is not important who does the biopsy, but it must be done without delay on any questionable lesion.

DIFFERENTIAL DIAGNOSIS

In the establishment of the differential diagnosis of oral squamous-cell carcinoma, the anatomical and physiological peculiarities of the mouth must be considered. The following is a list of diseases, by oral area, that should be considered when attempting a clinical diagnosis of oral carcinoma.¹⁷

Lips.—

1. Hyperkeratosis—absence of induration, ulceration and fissuring, biopsy necessary.

2. Syphilitic chancre—darkfield examination, history and serology.

3. Herpes simplex—prodromal symptoms and duration of lesion.

4. Tubercular ulcer—biopsy, history, tuberculin test.

Buccal Mucosa.—

1. Hyperkeratosis, smoker's patch.
2. Herpetic stomatitis.
3. Traumatic ulcers—chronicity, biopsy, establishment of aetiology.
4. Tubercular and syphilitic lesions.

Gingiva.—

1. Hyperkeratosis.
2. Inflammatory lesions of mechanical, thermal or chemical causes—history, biopsy.
3. Herpetic ulcers.
4. Peripheral giant cell tumours — biopsy.
5. Syphilis, leukaemias, drug hyperplasia and diabetes.
6. Benign tumours (papillomas, fibromas, lipomas, haemangioma)—biopsy.

Tongue.—

1. Hyperkeratosis.
2. Lichen planus—linear arrangement of lesion.
3. Nutritional deficiencies—pernicious anemia — papillary atrophy, redness, glossopyrexia, glossodynia.
4. Syphilitic chancre, mucous patch or gumma—biopsy and serology.
5. Benign tumours.

Palate.—

1. Mixed tumours—biopsy.
2. Torus palatinus.
3. Hyperkeratosis—always biopsy in this area.
4. Benign tumours.
5. Cysts (median, incisive canal, radicular)—radiographs and biopsy.
6. Syphilitic lesions.

Floor of the Mouth.—

1. Ranula—history and behaviour of lesion.
2. Vincent's angina — dramatic onset and acute inflammatory symptoms.
3. Inflammatory ulcers.

TABLE 5 Frequency of metastasis.^{5,6,18}

Primary site	Number of lesions	Per cent local metastasis	Per cent Smith's studies	Per cent Topazeau studies
Tongue	21	71	60	23
Lip (lower)	17	18	6	0
Tonsil	7	71	—	44
Palate	2	100	44	25
Buccal mucosa	6	17	50	0*
Floor of mouth	7	71	55	31
Gingiva	3	33	30	0*

*Less than eight cases each.

4. Secondary syphilitic lesions—rarely occur here.

METASTASIS

Sometime during the uncontrolled proliferation of epithelial cells, within the local limits of the tumour, the cells invade the walls of lymph channels or blood vessels forming cellular emboli. This invasion may happen just a few weeks after the tumour's inception. The lymph vessels are usually invaded and so occasionally are veins; for some reason the arterial structures appear to have some immunity to the cancer cells.¹⁸ Oral carcinoma generally metastasizes locally (cervical lymph nodes) between sixty and seventy per cent of the time, depending upon the primary site of the lesion. It was formerly believed that death from cancer of the head and neck almost always resulted from local and regional development of the disease, and the impenetrability of the collar of lymphatics about the neck was proposed as the reason that metastasis of oral tumours was restricted to regional lymph spread.

According to Sveda, remote or visceral metastasis from oral carcinoma occurred in only one per cent of all cases.¹⁹ Distant or remote metastasis may be defined as the dissemination of the disease to

organs or tissues below the levels of the clavicles. The one per cent figure is based upon clinical evaluation without necropsy.

Topazian found distant metastasis in twenty-four per cent of all deaths due to oral carcinoma when necropsy was performed. He proposes that all cellular emboli do not develop metastasis but depend upon favourable conditions existing in the host tissues. A factor to be considered in distant metastasis is the ability of the host tissue rapidly to produce a blood supply for the tumour tissue, which in turn must be capable of withstanding the period before vascularization—therefore the embolic cells could not be mature cells but must have remained quite undifferentiated. The most common primary sites for the production of distant metastasis were the tonsil, floor of the mouth, palate and tongue. The most common secondary site was the lung, occurring in seventy per cent of the distant metastasis. Other secondary sites were the liver, heart, spleen, kidney, adrenal gland, diaphragm and the oesophagus.¹⁹

In our study of sixty-two cases, thirty-two underwent metastasis (52 per cent), and only four (6 per cent) showed distant metastasis. Two metastasized to the lungs and one each to the stomach and liver; however, necropsy studies were not presented. Ninety-one per cent (29) of those patients who had secondary growths died soon thereafter, while death occurred in only ten per cent of those that did not

metastasize. The most frequent primary sites of metastasis were the tongue (71 per cent), floor of the mouth (71 per cent) and the tonsil (71 per cent). The least frequent sites were lesions of the cheeks, metastasizing only seventeen per cent of the time.

TREATMENT

Surgery.—Surgery is one of the two proven ways of curing oral carcinoma. It should be undertaken only by those who have been trained in head and neck surgery and who also have a thorough knowledge in reconstructive surgery and a fundamental and practical knowledge of radiation therapy.

The management of oral malignancies is not a one-man job. It is mandatory that the dentist, surgeon, and radiotherapist work together closely with open minds to effect a prompt cure.

The extent of the surgical procedure is dependent upon three primary considerations, all of which are interrelated: (1) the site of the lesion, (2) the size of the lesion; and (3) the extent of cervical or distant metastasis if present. This then presents a range of operations from a relatively simple V-wedge excision and primary closure of a very small lesion on the lower lip, to a radical bilateral neck dissection of a lesion on the tongue with cervical metastasis. Each case of oral carcinoma presents its own problems, and it is the duty of the surgeon to follow those procedures which have had the greatest amount of success.

Irradiation.—Irradiation is the other proven method of curing oral carcinoma. It consists of subjecting the neoplasm to a high enough dose of radiation to destroy its cells without destroying the host's cells.

Nearly all lesions of oral carcinoma respond well to radiation therapy, and complete eradication of the tumour by radiation should be obtained in a large percentage of cases if treatment is begun early and is properly executed.

The major agents used in radiation therapy are x-ray, radium and artificially radioactive substances such as cobalt⁶⁰. Radium is used in two ways, as radium needles or seeds, and as teleradium, a machine constructed to house a large quantity of radium from which emitting radiation can be controlled.

The important thing to be considered in radiation therapy is that a cancerocidal dose must be administered to all parts of the tumour. Location of the tumour and experience of the radiologist are the deciding factors as to whether x-rays, radium needles, radon seeds, teleradium or Cobalt⁶⁰ will be used. Radiologists have had success with their own particular techniques as to the agent used, amount of radiation, duration of radiation, and length of time between radiation treatment—all merit consideration.

A combination of irradiation and surgery is used most commonly in the treatment of oral carcinomas that have metastasized to cervical lymph nodes. Irradiation is used for the primary lesion, and surgical dissection is used on the metastatic lymph nodes.

Other Therapy.—Hormone therapy is of little value in treating squamous-cell carcinoma of the oral cavity. It is true that hormone therapy, like irradiation, changes the growth habit of malignancies, but unless the neoplastic cells involved are derived from a tissue normally respondent to hormone influence and unless they have sufficient differentiation to be dependent on hormones for their continued development, hormone therapy is ineffective.²⁰

The chemotherapeutic agents at this time are not too successful either in the treatment of neoplastic diseases. The biggest problem is the non-selectivity of the chemical compounds. The reason for their use is that they are more injurious to the rapidly dividing cells being anti-mitotic or cytotoxic, probably through their tendency to react with deoxyribonucleic acid. The limitation of these com-

pounds, such as nitrogen mustard, is the damage they do to the haemopoietic system.

Other antimetabolic drugs interfere with the process of nucleic acid synthesis and so prevent cell division. Their effect is indiscriminate, and all proliferating cells of the body are affected.

Management of Teeth.—The management of teeth in oral carcinoma presents a problem when irradiation treatment is planned for the patient. Any patient that is subjected to intensive irradiation of the mandible or maxilla is a possible candidate for osteoradionecrosis.

Osteoradionecrosis is a pathological change in bone largely due to the usually permanent damage of the vascular bed from the radiation. The relatively poorer circulation to the mandible explains why this bone is more often affected than the maxilla. Osteoradionecrosis is characterized by late sequestration and sometimes permanent deformity.

An intensively irradiated jaw is never safe, and for this reason all attempts should be made to shield as much bone as possible when radiation treatment is undertaken. At no time after irradiation to the alveolar bone should an extraction of a single tooth be considered a safe procedure. This irradiated bone is always a point of weakness, and any trauma may set in motion a chain of events that may lead to osteoradionecrosis. Dentures should not be constructed for at least twenty-four months after irradiation.²

When radiation therapy to an area in which bone can not be protected is contemplated, a preparative procedure should be carried out to help minimize the possibility of osteonecrosis. This consists of extraction of those teeth that are in the bone that is to be irradiated. This should be done ten to fourteen days before irradiation treatment is started. Good teeth as well as bad teeth should be sacrificed because it is not known when the apparently sound teeth may become involved in some pathological process.

PROGNOSIS

The most important factor that will determine the prognosis of oral carcinoma is the length of time that has elapsed between onset of the disease and its diagnosis and treatment. Cancer is a very rapidly progressing disease and because of its characteristics of invasiveness and metastasis, early diagnosis will lead to the best prognosis.

Another factor that may determine the prognosis is whether the lesion is an exophytic or endophytic type. The endophytic with its higher degree of invasiveness and smaller surface area involvement is often more malignant than the outward or exophytic type. The exophytic type is more impressive and appears to be more dangerous, but it is not, and for this reason prognosis based on visual examination is very misleading.

The histological type of the tumour also will determine to some extent the prognosis. The well differentiated neoplasm is a slower progressing lesion than is the highly anaplastic lesion. Both lesions are sensitive to irradiation, but the undifferentiated faster growing lesion tends to be more sensitive.

The presence of metastasis also is another important factor. This generally occurs late in the disease process and is also related to the factor of length of time the cancer is present.

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University of Maryland Dental School

special article

Oral surgery: present and future

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This article was prepared in response to queries from some of our medical and dental confreres who felt that an accounting of the past history and present status of oral surgery would be timely and informative.

There are among the members of the dental profession certain individuals who limit their practice to the treatment of diseases, injuries and malformations of the human jaws and their associated structures. Included in this area of treatment are such conditions as difficult dental extractions, dental impactions, dental infections, exostoses of the jaws, jaw

fractures, cysts—both soft tissue and bony types, benign growths of the oral cavity, mandibular prognathism and retrognathism, alveolar ridge irregularities and hypertrophies, teeth lodged in the maxillary sinus by inadvertent manipulation, and oro-antral fistulae. Dentists performing this range of treatment selectively are known as oral surgeons.

As our readers are well aware, surgeons doing this type of surgery are not necessarily limited to members of the dental profession. Certain of the surgical procedures mentioned above are routinely performed by plastic surgeons, maxillo-facial surgeons, orthopaedic surgeons, general surgeons and otorhinolaryngologists, depending on the individual's particular training and the customs peculiar to his professional community.

This article is published simultaneously in the *Journal of the Canadian Dental Association* and in the *Canadian Medical Association Journal* through arrangement between the authors and the editors.

The oral surgeons being produced to-day are the product of a dental education plus a graduate program which has been specifically tailored to the needs of this anatomical region. There have always been areas of overlapping interest among the various specialties in surgery as far as the nature of their procedures is concerned and the oral cavity is no exception. For years it was common practice for the physician to look only at the tonsils and to overlook the adjacent structures during the oral part of his examination, while the dentist was guilty of looking solely at the teeth, failing to recognize abnormalities and disease processes in the same field of vision. There was an obvious need, therefore, for someone, from either the medical or dental profession, to take a special interest in the oral cavity and its contiguous structures, for it was realized that this small region of the human body was replete with various forms of pathology requiring special knowledge of the physiology, and anatomy and histology of the region in order to implement appropriate therapy.

Since members of the dental profession originally exhibited the interest in this realm, it fell to the dental schools to provide them with the training commensurate with the requirements. The following is a review of the history of the development of this dental specialty from its inception to to-day's status which has it sharing and enjoying the same professional training standards as the many other surgical specialties.

HISTORY

Oral surgery represents the maturation of an old and historically dental specialty—exodontia. As with all the health professions, dentistry has been undergoing a rapid academic and scientific evolution, particularly since the end of World War II. Although the Canadian Dental Association presently only recognizes three specialties—oral surgery, orthodontics and periodontics — a good

many dentists confine themselves to other limited areas of practice. Thus, in varying degrees, orthodontics, oral surgery, periodontics, paedodontics, dental public health, oral diagnosis, prosthodontics and restorative dentistry are recognized specialties in several provinces.¹ The dental schools of our universities have corresponding departments well integrated into their undergraduate teaching programs.

As is the case with our medical confrères, certain phases of our professional training have advanced more rapidly in the United States than in Canada. In 1918 the American Society of Oral Surgeons and Exodontists was organized. In 1929 the Society was incorporated under the laws of the State of Illinois as a component part of the American Dental Association. The purposes of the Society were "to promote and advance the science of Oral Surgery and Exodontia; to encourage research; to promote unity and harmony among its members and to elevate the standard of practice; to co-operate with other dental societies; and to enlighten the Dental and Medical Professions and the general public in matters relating to Oral Surgery and Exodontia." In 1944 the name of the Society was legally changed to the American Society of Oral Surgeons.² The Society continued its growth until to-day, with over 1,000 members, it represents a unified group endeavouring to promote and further the goals of oral surgery throughout the continent.

In 1938 the American Society of Oral Surgeons appointed a committee to study the need for a certifying board in oral surgery, and in 1946 the American Board of Oral Surgery was incorporated under the laws of the State of Illinois and was approved by the Council on Dental Education of the American Dental Association in 1947.²

The American Dental Association made an exhaustive study of the various dental practice acts and, after obtaining legal interpretation of these acts as applying to the practice of oral surgery, accepted at the annual session of the Board of

Trustees and House of Delegates of the Association in Cleveland in September, 1953, the following definition of oral surgery:

"The specialty of oral surgery is that part of dental practice which deals with the diagnosis, the surgical and adjunctive treatment of the diseases, injuries, and defects of the human jaws and associated structures.

"The scope of the specialty of oral surgery shall include the diagnosis and the surgical and adjunctive treatment of the diseases, injuries and defects of the human jaws and associated structures within the limits of the professional qualifications and training of the individual practitioner and within the limits of agreements made at the local level by the health team concerned with the total health care of the patient."

GRADUATE TRAINING PROGRAMS

Since the establishment of the American Board of Oral Surgery in 1946 there has been great interest and a large increase in the number of dentists, particularly the young graduates, desiring to fulfill the educational and training requirements of the Board so that they may be certified as oral surgery specialists. Three years of postgraduate training, including a year devoted to advanced work in the basic sciences in an approved institution, is one requirement.

These graduate training programs have been established in various universities and have superseded the short postgraduate courses formerly offered. Such graduate programs are designed to present systematically and comprehensively to graduate dentists a well-correlated course in the basic sciences as applied to oral surgery. Following completion of this course, which occupies a full academic year, the graduate dentist serves two or more years in an accredited hospital maintaining an active oral surgery service. During this period, he has close association with the residents in medicine and surgery and the various surgical specialties.²

A Committee on Graduate Training of the American Society of Oral Surgeons reviewed the entire concept of oral surgery training and submitted its report in 1956. The following excerpt is from that report:

"In appraising the status of graduate training, your committee does not look for uniformity, but is interested in minimum requirements in categories of didactic education and clinical training necessary to assure quality programs which will prepare the specialist to meet his obligations to the public and to the profession. Although the elements of good training may be woven into the fabric of residency programs with different techniques, the fundamental qualities of co-ordination and leadership must reinforce the assets of clinical material and facilities.

The graduate training should include the following:

First-year program.—Basic sciences which present fundamental facts on a graduate level are the building stones for the structure of clinical judgement in practice. Disciplines of anatomy, physiology, pathology, biochemistry, bacteriology and pharmacology require emphasis to establish advanced knowledge early. These may be formal didactic courses or their equivalent in concentration and attainments, depending upon the facilities of the institution. Anaesthesiology and radiology are other essentials to the first-year experience. Clinical experience of at least three months devoted exclusively to anaesthesia may require integration in the second year.

In addition to the usual basic science didactic work, preparations in the art and skill of physical diagnosis and clinical laboratory diagnosis are foundations for the subsequent two years of hospital training and therefore logically are included in the early period of the program.

Second-year program. — Emphasis now swings to clinical experience of the trainee, preferably in both outpatient and inpatient activities. Clinical material must provide a broad scope for evaluation, diagnosis, and treatment of surgical diseases of the mouth and jaws. While working in the clinic and on the wards, a close contact with other departments of the hospital correlates knowledge of oral disease with systemic disease and the problems of total patient care. Surgical

skill is developed in clinical procedures and in operating room experience through the role of assistant on major oral surgery cases. As a member of the junior hospital staff, the trainee participates in clinical pathological conferences, tumour boards, surgery rounds, and staff meetings, and other co-ordinated teaching activities of the hospital. Good reading habits are stimulated in this period through adequate library facilities, which should be readily accessible, and by the activity of a journal club in the Oral Surgery Department.

Where the graduate study program leads to a degree, provision is made as early as possible for investigational activity. A research problem selected after introductory experience in both clinical and basic science fields will offer more stimulation and satisfaction to the trainee in the development of a successful thesis.

Third-year program — In this residency year in the hospital the student should develop further clinical experience and responsibility in all areas of department activity. Specifically, when the resident has demonstrated surgical skill and judgement he should assume primary responsibility for major oral surgery cases in the operating room. Although supervision of this work is necessary, a complete training in our surgical specialty is not achieved until the senior resident has primary operating responsibility for a variety of major cases.

Degree programs will require the completion of a thesis on clinical and experimental research in this year. When the training program does not lead to a degree, the resident should be encouraged to gain experience through the writing and publishing of at least one paper on a subject in the field of oral surgery during his last year of training.

The clinical experience of hospital training in oral surgery, therefore, must offer opportunity for increasing diagnostic ability, manual skill, and surgical judgement. Experience in both outpatient and inpatient activities is desirable.

The oral surgery service of the hospital must be integrated to the extent that all lesions of the mouth and jaws are referred for consultation and diagnosis. Emergency room evaluation and treatment represent another department function which provides experience essential to training.

Clinical training of the second year provides adequate material to perfect surgical skill in problems of tooth removal, odontogenic pathology, and local excision procedures. Orientation in operating room techniques is provided through adequate time in the role of assistant.²

There are at least sixty-three universities in the U.S.A. now offering graduate courses in oral surgery.⁴ One of these, the Graduate School of Medicine of the University of Pennsylvania, accepts over thirty students. On completion of the course, the graduate student may receive from the university a Master of Science degree. In Canada only the Faculty of Dentistry, University of Toronto offers a comparable program.³ Its three-year course leads to certification in oral surgery by the Royal College of Dental Surgeons of Ontario. For the Master of Science degree, a candidate must complete an original research project and present a thesis in addition to the three-year curriculum.

There often arises the question of whether a medical degree would be an aid in the preparation of the dental graduate for the practice of oral surgery. The time and expense required to acquire a medical degree are scarcely commensurate with the limited benefits obtained in regard to this goal. The practice of surgery, and especially the surgical specialties are not taught in the undergraduate departments of a medical school and the physician must spend several years in hospital training to achieve this end. In view of the foregoing then, it would appear better for the graduate dentist to spend three years acquiring special knowledge of basic medicine and developing surgical skill and judgement under the direction of a custom-tailored program for oral surgery, than to try to obtain a medical degree that does not train or qualify him to practice his specialty.

The oral surgeon is primarily a dentist. His desire is not to practise medicine but to practise intelligently a specialty of his own profession. He does not have to be

proficient in all fields; he will, like his medical confrères, seek consultations for his patients if it appears indicated.

Thus it can be seen that all the graduate courses and the practical training for the oral surgeon from the earliest times have been and are being offered by dental institutions in North America. Medical schools make no provision for coverage of this important phase of health care.

The American Hospital Association and Joint Commission on Accreditation of Hospitals require an adequate physical examination by a physician for all dental admissions. Whether this is done by the anaesthetist, with emphasis on heart and lungs, or whether it is performed by an internist, including a complete system review, is a matter for each hospital to decide. The dentist, however, can admit and discharge his own patient and be responsible for the patient's care and for the proper completion of the hospital records.²

Oral surgery has its own literature. The *Journal of Oral Surgery, Anesthesiology and Hospital Dental Service* is a publication of the American Dental Association. *Oral Surgery, Oral Medicine and Oral Pathology*, an independent dental journal published monthly, combines the science and practice of oral surgery with allied subjects, such as oral anatomy, oral radiology, oral pathology and oral medicine.

While exodontia is still a major part of oral surgery, the broader scope of this specialty brings greater diversity to the work of the oral surgeon. His training must accordingly be stream-lined and constantly improved. And because his field of activity is wider than it used to

be, the oral surgeon of today can well provide his specialized services to a community of 50,000 people. The belief that an oral surgeon must look for a city of half a million people or more is not necessarily true any longer. What an oral surgeon requires, just as much as a large population or a large number of general dental practitioners on which to base his practice, are good hospitals and all the facilities they can provide.

Although there are not many formally trained oral surgeons presently in practice in Canada, those who are so occupied have, for the most part, received their training in the United States. There is a very good reason for this. Not until 1953 did a training program, based on the concept of the American program as outlined above, begin in Canada when the University of Toronto commenced to offer a three-year program in oral surgery. Undoubtedly other Canadian dental schools will eventually follow suit and incorporate an oral surgery program in their graduate training. Thus, from this nucleus of young oral surgeons, our numbers will grow and with our numerical growth we shall endeavour to bring the latest knowledge and best techniques to further the oral health of our communities.

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Transactions of the Canadian Dental Association • The Association's *Transactions* contain reports of activities of the various bureaux, councils and committees. Published in English and in French after every meeting of the Board of Governors, it is recommended reading for all Canadian dentists.

PROTEINS IN DEVELOPING BOVINE ENAMEL

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Developing molar tooth germs were removed from calf mandibles. The dental hard tissues were freed of surrounding cellular material and brushed lightly with distilled water. The slightly mineralized enamel was peeled from the hard underlying dentine and decalcified in .25 M phosphoric acid.

Enamel protein was almost completely precipitated by addition of chloride to a concentration of .3 M. Reversible precipitation could also be effected with nitrate, sulphate or EDTA (pH 7.1). Enamel protein remained soluble in the presence of phosphate concentrations up to 1.5 M.

Electrophoresis on starch-urea-formate gels (pH 3.2) resolved the protein of developing enamel into two major protein bands. Prolonged electrophoresis (36 hours) showed the presence of three additional minor bands. Similar results were obtained using starch-formate gels (pH 3.2), starch-borate gels (pH 8.6) and acrylamide-TRIS-glycine gels (pH 8.9).

It is possible that these multiple protein bands, shown on the starch gels, were really artefacts produced by chemical degradation of a single protein. This possibility is lessened by two additional observations: (1) the chloride insoluble pro-

tein from developing enamel samples showed the same electrophoretic components regardless of whether demineralization was effected with .15 M hydrochloric acid, .25 M phosphoric acid or .25 M EDTA (pH 7.1); and (2) protein extracted from developing enamel with 8 M urea—without prior demineralization or protein precipitation—showed the typical electrophoretic pattern of two major and three minor protein components.

Preliminary work indicates that gel filtration with sephadex G-75 can be used to isolate the major protein components.

SPECIFIC ACTIVITY OF CITRATE IN THE BONES OF THE RAT FOLLOWING EXPERIMENTAL CONDITIONS

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The specific activity of bone citrate $\left(\frac{\text{radioactivity of citrate}}{\text{molarity of total citrate}} \right)$ has been determined in rats injected with radioactive citrate following treatments with parathyroid hormone, sodium fluoroacetate on bilateral nephrectomy. In general, conditions which cause an increased citricaemia favour an increase in the specific activity of bone citrate. Concurrently the specific activity of carbon dioxide has been established.

The determination of the specific activity of bone citrate goes through three

Summaries of reports delivered at the Second Canadian Conference on Dental Research held at Banff, Alberta, October 9-11, 1962.

major analytical steps: (1) solubilization of bone citrate, (2) microdetermination of citrate by the pentabromoacetone method, and (3) measurement of radioactivity carbon dioxide evolved from citrate oxidation by means of the ion chamber method.

FURTHER STUDIES ON THE METABOLISM OF THE ORAL MICRO-ORGANISMS IN SALIVA-SUBSTRATE MIXTURES IN VITRO

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Earlier studies on the metabolism of plaque in situ showed that plaque could produce acid rapidly from carbohydrate to give plaque pH decreases (Kleinberg, 1961a)¹ whereas with nitrogenous substrates the reverse was observed (Kleinberg, 1961b).² Correlation of these pH curves with pH curves in saliva-substrate mixtures showed that many changes in these two systems produced similar effects (Kleinberg, 1960),³ (Kleinberg, 1962).⁴

In the present investigation, the interaction of different concentrations of glucose and urea at various sediment levels in vitro were studied as a preliminary to comparable studies in vivo. The glucose levels tested ranged from 0-30 per cent (W/V); urea from 0-10 per cent (W/V); and the three sediment levels tested were 1.6 per cent, 12.5 per cent and 25 per cent (W/V). Although the quantity of sediment that could be obtained at any one time was relatively small, the micro-procedures used made the study of these large number of interactions feasible. The experimental procedure was similar to that employed previously, using pH change as indicator of the rate of end-

product formation in these systems (Kleinberg, 1962).⁴ The results for the different sediment concentrations were essentially similar except that more rapid pH changes were found at higher sediment levels. In the presence of increasing levels of urea, glucose concentration-pH curves were progressively shifted in an alkaline direction so that at urea levels of approximately 1 per cent, all points on these curves were above 0 hour levels. In the urea concentration-pH curves, whether glucose was present or not, no substrate inhibition was observed at the higher urea levels tested. However, with corresponding glucose concentration-pH curves, substrate inhibition occurred when urea levels were zero or low. At high levels, no substrate inhibition occurred since pH curves were simply straight lines above the zero hour line. The results in general indicate that urea is more rapidly dissimilated than glucose.

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RELATIONSHIP OF SULPHATED POLYSACCHARIDES TO FIBRE FORMATION IN CONNECTIVE TISSUE

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Sulphated polysaccharides are believed to be intimately associated with the formation of collagen fibres, but the

nature of this relationship is obscure. Just prior to fibre formation the concentration of sulphated polysaccharides becomes high, and then decreases as the fibres are formed. Ascorbic acid deficiency or high cortisone administration suppresses both sulphation of polysaccharides and fibre formation. This suppressive action of cortisone on fibre formation in cotton granuloma was overcome by the addition of bacteria¹ or cartilage extracts.² This negation of cortisone inhibition was believed to be due to an increase in acid polysaccharides.¹

Collagen fibre formation can be provoked by carrageenin, a sulphated polysaccharide of sea moss origin. An experiment was carried out to see if collagen fibre formation would still be evoked by carrageenin* in the presence of high amounts of cortisone. It was found that in male rats cortisone did not inhibit collagen fibre formation in the carrageenin granuloma, while completely inhibiting formation of these fibres in skin wounds and in implanted cotton pellets in the same animals at the same time.

*Supplied by the Seaplant Corporation.

To study the importance of the sulphate groups of carrageenin in evoking fibre formation a cationic dye, azure A, was combined with carrageenin to block the sulphate groups. Granulomas due to carrageenin were compared to those produced by the combined carrageenin-azure A in the same guinea pigs. It was found that blockade of the sulphate groups reduced the weight and size of granulomas to less than half that of the unblocked carrageenin. The carrageenin-azure A granuloma was similar to that produced by agar, which like carrageenin is a polygalactose, but unlike carrageenin has very few sulphate groups.

These findings further confirm that polysaccharides are intimately associated with collagen fibre production, and indicate that the sulphate groups are particularly significant. The action of cortisone in depression of fibre formation appears to be due to inhibition of sulphation of polysaccharides, for if sulphate groups

are provided in appropriate form collagen fibres do form in spite of the presence of adequate amounts of cortisone. Even though intracellularly located in phagocytes, carrageenin appears to influence fibre formation. This supports the view³ that the sulphate groups act as cation exchangers to create an ionic environment necessary to fibre formation, and indicates that this can occur without the polysaccharide becoming incorporated into or between the fibres.

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HISTAMINE AND 5-HT ANTAGONIST FROM HUMAN AND EXPERIMENTAL ANIMAL TISSUE EXTRACTS

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It has been shown that human and experimental animal gingival tissue contains histamine, 5-HT and a histamine 5-HT inhibitor. Due to the difficulty in acquiring adequate amounts of gingival tissue, other tissues were also studied. It was observed that normal gingiva, brain, and colon were richest in the inhibitor and that growing tissue such as hyperplastic gingiva and cancerous tissue contained considerably less of the inhibitor. Investi-

gation is being carried out to elucidate the physiological function of the inhibitor and its chemical make-up.

AUTORADIOGRAPHIC STUDY OF THE DEVELOPING TEMPOROMANDIBULAR JOINT

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Thymidine has been shown to be an essential precursor of deoxyribonucleic acid (DNA). It has also been shown that it is not used in the synthesis of any other material in the body. Tritium-labeled thymidine, when injected into animals, becomes incorporated into the nuclei of those cells which are synthesizing DNA during the period of chromosomal replication prior to dividing. Thus, the sequence of cell proliferation and migration may be followed in tissues by means of autoradiography.

This method was employed to study the cellular activity in the various structures of the developing temporomandibular joint. Twenty-one female rats of the Wistar strain were divided equally into three age groups: 2 days, 10 days, and 30 days. Each animal was given a single intraperitoneal injection of tritium-labeled thymidine equivalent to 1 microcurie/Gm. of body weight. One animal from each age group was killed $\frac{1}{2}$ hour, 1 hour, 4 hours, 1 day, 2 days, 4 days, and 6 days after injection.

During the early periods following injection, labeled cells were observed throughout the joint except in the maturing zone of cartilage of the condyle. During the later periods, cells of the maturing zone of cartilage were also labeled. In the youngest animals, (1) cell proliferation was the most active, (2) the transitional zone, between the cartilage

and the fibrous articular surface, was the most extensive, and (3) the migration of labeled cells from the transitional zone to the maturing zone of cartilage was the most rapid. The reverse was true in the oldest animals.

With the exception of the cartilage zone in the condyle, the results of this study indicate that each component of the joint possesses undifferentiated cells from which the more specialized cells arise. The undifferentiated cells in the transitional zone produce the chondrocytes of the cartilage zone but do not produce the fibrocytes of the fibrous articular surface.

GENETIC STUDIES ON PROTEIN CONSTITUENTS OF SALIVA

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The protein constituents of human saliva have been studied by means of starch gel electrophoresis. The electrophoretic system employs an acidic buffer, and urea is incorporated into the gel medium to improve the quality of electrophoresis. Using this system, as many as ten protein zones can be detected in the parotid saliva of some individuals, and as many as twelve zones in the extraparotid saliva. There are frequently marked differences in the protein patterns in saliva collected from different individuals. An investigation is in progress to establish whether these differences are determined by hereditary or environmental factors. In a preliminary survey saliva was collected from a group of sixty twins, including both identical and non-identical pairs. A study of the electrophoretic patterns of these samples may help to identify instances of genetic polymorphism in the salivary proteins.

Attend the Board of Governors meeting

Each year when the Canadian Dental Association holds its annual convention, the eighteen members of the Board of Governors who represent 5,868 members of the Association meet to hear the reports of the president and secretary, to receive the recommendations of the Association's councils, committees and specialty sections, and to determine the policies which govern the Association.

Individual members of the Association not only may attend the Board meeting; they are strongly urged to do so and to participate in the affairs of the profession.

Board meetings usually extend through the four days preceding the convention. Business is conducted with the aid of reference committees appointed by the president, each composed of Board members and individual Association members present on this occasion. These reference committees are provided with a specific frame of reference, such as research, specialists and specialization, auxiliary services, or dental education. All reports and resolutions dealing with these topics are referred to the appropriate reference committee where they are given careful study. Any member of the Association may express his views to a reference committee; indeed he is invited to do so. After consideration by the reference committee, recommendations in their original

or amended form are referred back to the Board of Governors. The Board meets in open session and, although only Board members may vote at these formal sessions, individual Association members may again enter into all discussions of the Board and bring persuasion to bear upon the members of the Board in the formulation of policies.

Only after the most careful consideration and approval by the Board can a recommendation of the reference committees become the official policy of the Association. In this way the will of the majority prevails with scrupulous regard for the opinions of all concerned.

But the system will only really work as intended if more dentists will participate in Board meetings and communicate their ideas. Communication is the lifeline of our profession. The stronger it is, the better it binds us into an effective organization; without it there is confusion — without it there is no strength.

A local dental society can make an important contribution toward improving the lines of communication between individual members and the national organization. This it can do by nominating one of its members to attend the Board of Governors meeting in Toronto next May. This should be done without delay. Time is short and it is important to act now.

Support for a Royal College of Dentists of Canada

For some years the Association's Specialists and Specialization Committee has concerned itself with the problem of achieving some national uniformity in the dental specialties. The urgent need for such a measure has been previously discussed in these columns and does not require repetition at this time.¹

Suffice it to say that there is no uniformity whatever in the recognition given to various specialties across Canada. Three provinces recognize no specialties at all, three recognize three specialties, one province recognizes four specialties, two provinces recognize five specialties, and one province recognizes seven specialties. This pattern strongly suggests that the corporate members of the Canadian Dental Association, particularly in smaller provinces, must experience great difficulty in deciding which specialties should be recognized and who should be certified as a specialist.

The Specialists and Specialization Committee accordingly recommended the creation of a national agency to be known as the Royal College of Dentists of Canada. This college would provide a suitable mechanism for establishing appropriate criteria for qualification and recognition as a specialist. These functions would be analogous to those of the Royal College of Physicians and Surgeons of Canada. Experience with the latter organization suggests that a similar dental college could over the years materially raise the academic standards of dentistry in general and of the dental specialties in particular.

Agreement of the Board of Governors was expressed at the annual meeting in Vancouver when the Board directed the Executive Council to seek legislation to incorporate the proposed Royal College of Dentists of Canada according to the

pattern proposed by the report of the Specialists and Specialization Committee.

Two points must be considered before this step is taken. First, obtaining a federal charter involves the expenditure of a considerable sum of money. Secondly, the college cannot be expected to fulfil its function unless it enjoys the confidence of the profession. One would want to have reasonable assurance that support would be forthcoming in both respects. Nothing could be worse than to embark on a course of action which might ultimately fail for want of this support.

It seems reasonable to assume that the attitude of the Executive Council will be strongly influenced by knowledge of what support the project enjoys and how firm that support is. Of particular concern in this regard are the attitudes of the individual corporate members and of the recognized specialty groups.

The financial commitment involves the initial cost of incorporation and additional financial support for a certain number of years until the college becomes self-sufficient.

There are four possible sources of contribution: individual candidates' fees for examination and membership, the Canadian Dental Association, the specialty groups and the corporate members. Contributions from individual candidates will be insignificant for some time to come until a large enough body of members is established. This may take several years, at least. Obviously the other three groups will have to be relied upon during the college's early critical period of existence.

Tangible support from the corporate members and from the specialty groups would encourage the Executive Council to proceed toward incorporation of the college when it meets at Association headquarters on February 11-14, 1963.

Assurance of this support could set in motion a chain of events of considerable benefit to the progress of dental science in Canada.

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bureaux • committees • councils

Average income of Canadian dentists, 1960 Moyenne des revenus des dentistes du Canada, 1960

Bureau of Economic Research

From 1958 to 1960, dentists have ranked fourth among all taxpayers in average income earned. The most recent issue of the Department of National Revenue's annual *Taxation Statistics* reveals that the average income of the tax paying dentist was \$12,238 in 1960, a five per cent increase over the 1959 figure. Twenty-nine per cent of all dentists were in the \$10,000-\$15,000 income bracket while 17 per cent earned between \$15,000 and \$20,000.

The average income of dentists from professional sources was \$11,509. Their net income after taxes was \$9,857. An average of \$2,381, or almost 20 per cent of total income after practice expenses, went to taxes.

Persons making \$10,000 or over comprise three per cent of all Canadian taxpayers. This three per cent earns 13 per cent of all income and pays 31 per cent of all taxes.

The report warns that "since many persons do not have sufficient income to be taxable . . . *Taxation Statistics* does not cover all persons in any area or occupation." In 1960, at least 201 dentists earned too little income to be taxed. Forty of these were 65 years and over.

The number of persons listed in professions such as dentistry is consistently less

than those shown by professional directories. "This is because the taxation statistics covering these professional groups include only those whose chief source of income is from the practice of their professions." A dentist whose chief source of income is from salary is classified as an employee.

Les dentistes de ce pays, de 1958 à 1960, se sont classés au quatrième rang chez tous les contribuables pour la moyenne des revenus gagnés. Le rapport, *Statistique fiscale* que le Ministère du revenu national vient de publier, comme il le fait tous les ans, montre qu'en 1960 le dentiste, qui paie de l'impôt, a eu une moyenne de revenus de \$12,238. ce qui représente une augmentation de cinq pour cent sur celle de 1959. Vingt-neuf pour cent des dentistes se sont classés dans

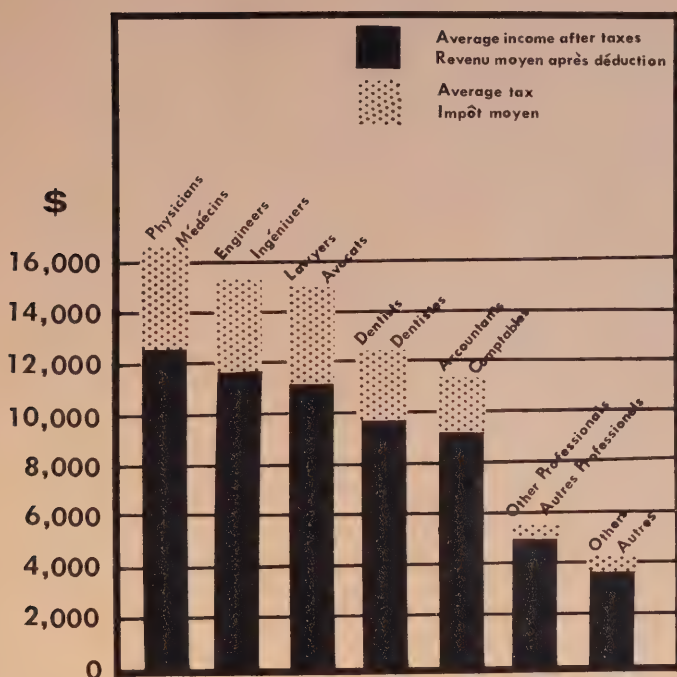


FIGURE 1 Average income of Canadian taxpayers, 1961 • Revenu moyen des contribuables canadiens, 1962.

le groupe de \$10,000. à \$15,000. et dix sept pour cent ont gagné entre \$15,000. et \$20,000.

La moyenne des revenus provenant de l'exercice de la profession s'est chiffrée à \$11,509. Le revenu net, après le paiement de l'impôt, s'est établi à \$9,857. Une moyenne de \$2,381., ou 20 pour cent du revenu total après la déduction des frais généraux du cabinet, a été payée en impôt.

Les citoyens qui gagnent \$10,000. ou plus, représentent trois pour cent de tous les contribuables. Ce trois pour cent gagne 13 pour cent de tous les revenus et paie 31 pour cent de tous les impôts.

Le rapport déclare que "bien des personnes, vu que leur revenu n'est pas assez élevé pour être imposable, ne sont pas obligées de

produire de déclarations; la *Statistique fiscale* ne porte donc pas sur toutes les personnes qui habitent tel endroit ou exercent telle occupation." Au moins 201 dentistes, en 1960, n'ont pas retiré des revenus suffisants pour devoir payer des impôts; quarante de ceux-ci avaient 65 ans et plus.

Le nombre des personnes classifiées comme faisant partie d'une profession — telle que la chirurgie dentaire — est inférieur à celui apparaissant dans les bottins professionnels. "C'est parce que la statistique fiscale de ces groupes professionnels comprend seulement les personnes dont la principale source de revenu est l'exercice de leur profession." Un dentiste dont la principale source de revenus lui vient d'un salaire est classifié comme un employé.

TABLE 1 Average income before and after taxes of Canadian taxpayers, by occupation, 1960, and average tax as a percentage of average income • Revenu moyen avant et après déduction de l'impôt des contribuables canadiens classés selon leur occupation, 1960, et impôt moyen en pourcentage du revenu moyen.

Occupation	Average income Revenu moyen		Average tax as percentage of average income Impôt moyen en pourcentage du revenu moyen
	Before taxes Avant déduction de l'impôt	After taxes Après déduction de l'impôt	
Physicians and surgeons médecins et chirurgiens	\$16,323	\$12,610	22.7
Engineers and architects ingénieurs et architectes	15,670	11,825	24.5
Lawyers and notaries avocats et notaires	14,597	11,097	24.0
Dentists dentistes	12,238	9,857	19.5
Accountants comptables	11,446	9,164	19.9
Other professionals autres prof. libérales	5,683	4,916	13.5
All others tous les autres	4,153	3,769	9.2
TOTAL	4,232	3,826	9.6

TABLE 2 Percentage distribution of dentists and of all taxpayers, by income class, 1960 • Comparaison en pourcentage des revenus des dentistes avec ceux de tous les autres contribuables, par catégories de revenu, 1960.

Income class Catégories de revenu	Per cent — Pourcentage		Cumulative % Cumulatif	
	Dentists Dentistes	All taxpayers Tous les contribuables	Dentists Dentistes	All taxpayers Tous les contribuables
under - moins de \$2,000	1.3	14.8	1.3	14.8
\$2,000 - 3,000	1.8	20.0	3.1	34.8
\$3,000 - 4,000	5.1	22.8	8.2	57.6
\$4,000 - 5,000	4.1	18.3	12.3	75.9
\$5,000 - 6,000	5.1	10.3	17.4	86.2
\$6,000 - 7,000	5.6	5.1	23.0	91.3
\$7,000 - 8,000	6.0	2.8	29.0	94.1
\$8,000 - 9,000	6.6	1.6	35.6	95.7
\$9,000 - 10,000	7.4	1.0	43.0	96.7
\$10,000 - 15,000	28.6	2.0	71.6	98.7
\$15,000 - 20,000	17.1	.6	88.7	99.3
\$20,000 - 25,000	7.0	.2	95.7	99.5
\$25,000 and over — et plus	4.3	.5	100.0	100.0

TABLE 3 Average income of dentists in 1960, by province, arranged in order of average income • Revenu moyen des dentistes, 1960, par province, par ordre de revenu moyen.

Province	Average income Revenu moyen	Province
British Columbia	\$13,708	Colombie britannique
Ontario	13,131	Ontario
Alberta	13,038	Alberta
Saskatchewan	12,864	Saskatchewan
Newfoundland	12,211	Terre-Neuve
Nova Scotia	11,674	Nouvelle Écosse
Manitoba	11,589	Manitoba
New Brunswick	10,177	Nouveau-Brunswick
Prince Edward Island	9,524	Ile-du-Prince-Édouard
Quebec	9,331	Québec

TABLE 4 Per cent increase in incomes and taxpayers, by occupation, 1950 - 1960 • Augmentation en pourcentage des revenus et des contribuables, selon leur occupation, 1950 - 1960.

Occupation	Per cent increase Pourcentage d'augmentation	
	Average income Revenu moyen	Taxpayers Contribuables
Physicians and surgeons médecins et chirurgiens	65	67
Engineers and architects ingénieurs et architectes	43	35
Lawyers and notaries avocats et notaires	51	58
Dentists dentistes	97	23
All taxpayers tous les contribuables	43	85

Board of Governors • The Board of Governors of the Canadian Dental Association is composed of members selected by dental organizations in all ten provinces. The Board meets annually just before the national convention of the Association. Any member of the Canadian Dental Association may participate in the Board's annual meeting. Canadian dentists are urged to avail themselves of this opportunity to participate in the affairs of their profession.

The Association

DENTAL SERVICES COMMITTEE MEETS

The Dental Services Committee met at Canadian Dental Association headquarters, November 5-6, 1962. Present were L. Bernier of Quebec City; W. J. Dunn of Toronto; B. M. MacKenzie of Edmonton; H. G. Pettapiece of Parksville, British Columbia; R. A. Clappison of Toronto; H. J. MacConnachie of Halifax; H. W. Reid of Toronto; H. M. Jolley of Toronto; W. G. McIntosh of Toronto, chairman; Don W. Gullett, Canadian Dental Association secretary; and other Association staff members. Attending parts of the meeting were M. V. J. Keenan, Canadian Dental Association president; R. D. Leuty representing the Orthodontic Section of the Canadian Dental Association; and also O. J. Yule and W. W. Pressey of Toronto.

Subjects included on the agenda covered: the pro-ration device in payments to dentists under prepayment plans; the principle of personal contribution by patients who are beneficiaries in dental prepayment plans; the status of dental service corporations and of Canadian Dental Service Plans Inc.; revision of the Association's statement on health insurance; progress report of the sub-committee on fees; Canadian Dental Association headquarters staff dental prepayment plan; a prepayment plan for orthodontic services; report of the subcommittee on group practice; report on the First National Conference on Administration of Prepaid Dental Care Programs held in Seattle, Washington, September 24-26, 1962; the question of a college of general practice; and a submission from the Canadian Dental Association to the Royal Commission on Taxation.

Dr. Pettapiece reported that the British Columbia Dental Services (the first dental service corporation to be established in Canada) is now registered under that province's

Societies Act. Funds have been granted by the British Columbia Dental Association to set up this organization. Studies are underway with a view to establishing a pilot prepaid plan for dental care.

The committee adopted a resolution recognizing the applicability of the pro-ration feature to plans which may be developed or administered by non-profit agencies sponsored by the dental profession, and recognizing provincial fee schedules in the application of payments for dental services by government, together with an agreed percentage deduction from fees to cover administration costs. In adopting this resolution, the committee feels that the profession retains in principle the privilege of setting fees or fee schedules.

The sub-committee on fees has developed a formula based on the relative value system and incorporating as components of the formula time, skill (knowledge, judgement and responsibility), and laboratory costs. The overhead cost factor is incorporated into the final portion of the formula. Members of the Dental Services Committee will study the report of the sub-committee on fees for future comment.

R. D. Leuty described an orthodontic treatment priority estimate which has been developed from the Burlington Orthodontic Research Project. In view of the extent of malocclusion and the scarcity of orthodontists a system of priorities would have to be considered under any orthodontic prepayment plan. Dr. Leuty also stressed the need for further investigation into the causes of malocclusion and the development of effective methods of interception. He also emphasized the urgency of health education of the public regarding malocclusion. The committee also recommended that the Council on Education urge all Canadian dental schools to design their programs of instruction to meet future needs for orthodontic care so that general practitioners will accept full responsibility for the management of cases not requiring the attention of a trained orthodontist.

O. J. Yule presented a comprehensive report on group practice. The report particularly stressed the advantages, disadvantages, problems and illusions regarding this type of

practice. This report will likely be published as a monograph.

The Dental Services Committee believes there is a real need to advance the establishment of dental service corporations. British Columbia has the only one, although the matter is receiving attention in others. In support of this trend, the committee recommended: the establishment of a clearing house for information on prepaid dental plan developments in Canada and abroad; the publication of a newsletter containing current items on prepaid dental plans and associated matters; encouragement and support for meetings of representatives of the Dental Services Committee, of the provincial dental services committees, of existing dental service corporations and Canadian Dental Service Plans Inc.; and the establishment of funds for the development of dental service plans from which grants could be made to the provinces under stipulated conditions.

AMERICAN COLLEGE HONOURS C.D.A. SECRETARY

The American College of Dentists has honoured Canadian Dental Association secretary Don W. Gullett with its William John Gies award. The citation, presenting Dr. Gullett for the award, was read by P. G. Anderson of Toronto during sessions held at Miami in conjunction with the annual meeting of the American Dental Association.

From time to time the College recognizes in this way fellows who contribute "to the advancement of the profession and its public relations through unusual devotion to the task designed to move the profession's frontiers forward."

CANADIAN FUND FOR DENTAL EDUCATION STARTS OPERATIONS

The new Canadian Fund for Dental Education can be expected to provide a big stimulus to dental education in this country. This was the unanimous consensus of the members of the fund's board of trustees when they held their inaugural organizational meeting in Toronto, November 30, 1962.

Chairman of the fund is J. D. MacLean, dean of the Faculty of Dentistry at Dalhousie University, Halifax. M. E. Bower, president of the Dental Company of Canada, is vice-chairman. The other three trustees of the fund, representing geographic areas of Canada, are L. Lépine of Montreal, H. W. Reid of Toronto, and W. P. Munsie of Vancouver. K. L. Croft of Toronto is secretary of the fund.

Earlier this year the Canadian Dental Association recommended to the Royal Commission on Health Services a substantial increase in facilities for educating dentists as well as the removal of economic barriers to attaining a dental education. The Association emphasized its concern by offering to

J. D. McLean (c.), chairman of the Canadian Fund for Dental Education receives the first donations to the fund, a cheque from the dealers and manufacturers of the Canadian Section of the American Dental Trade Association delivered by M. E. Bower (l.), president of the Dental Company of Canada and vice-chairman of the fund, and a cheque from the Canadian Dental Association delivered by D. W. Gullett (r.), Association secretary.





Shown at the inaugural meeting of the board of trustees of the Canadian Fund for Dental Education in Toronto are (l. to r.) W. P. Munsie of Vancouver, trustee; I. Lépine of Montreal, trustee; M. E. Bower of Toronto, representing the dental supply industry and vice-chairman of the fund; J. D. McLean of Halifax, chairman; K. L. Croft of Toronto, secretary; Don W. Gullett, Canadian Dental Association secretary; H. W. Reid of Toronto, trustee; and F. H. Compton, editor of The Journal.

donate \$50,000 toward a revolving student loan fund if the federal government would match this sum. Conceived and launched by representatives of the dental supply industry and the dental profession, the Canadian Fund for Dental Education is yet another tangible expression of concern on the part of these two groups and demonstrates their willingness to help themselves.

The fund commenced operation with a donation of \$15,000—\$10,000 donated by the dealers and manufacturers of the Canadian Section of the American Dental Trade Association, and \$5,000 donated by the Canadian Dental Association.

The purposes of the fund, as set out in the trust deed, are: "(1) to receive moneys or negotiable securities in any form for the purpose of aiding and assisting dental education, directly or indirectly, through projects designed to improve dental health by means of teaching and research in co-operation with dental schools and the students thereof; (2) to assist in the growth, development and advancement of dental education by investigation of problems related to education; (3) to grant moneys for the purpose of assisting in the elevation of qualifications for teaching personnel; and (4) to aid meritorious students in dentistry, where deemed necessary, by means of loans. . . ."

The fund will initially operate under a trust deed administered by the Canadian Dental Association. However, policies concerning fund raising and grants are the responsibility of the trustees. If circumstances warrant, the fund may later be incorporated under its own federal charter.

NEW DENTAL HEALTH PAMPHLET AVAILABLE

The pamphlet, "Dental Health Guide for Teachers and Parents" is now available

from Canadian Dental Association headquarters at \$1.65 per hundred. This is a revised edition of an older pamphlet under the same title. The pamphlet was revised by the Council on Public Health.

Canada and the Provinces

SECOND NATIONAL SCIENCE FAIR SLATED FOR TORONTO

The Second Canada-Wide Science Fair will be held at Casa Loma in Toronto, May 3-4, 1963. This announcement was recently made by the Canadian Science Fairs Council, the organization which administers this annual event. The Canadian Dental Association is one of thirteen sponsors of the Canadian Science Fairs Council and donates two awards of \$100 each for winners in national competition in the dental field. Co-sponsors of the fair for 1963 are the West Toronto Kiwanis Club (the lessee of Casa Loma), the Agriculture and Agricultural Science Teachers' Association of Ontario and the Ontario Science Teachers' Association.

A science fair is an annual exhibition of high school students' scientific projects, experiments or collections. The purpose of a

science fair is to show the scope and magnitude of the creativeness and enterprise of which young scientists are capable.

Science fairs may be sponsored locally by schools, service clubs, professional societies and other groups. Representatives of these groups encourage students to prepare exhibits on some scientific subject. The winners of local contests compete for regional awards and the finalists of regional contests compete for national honours.

At the national event in Toronto next May, outstanding achievement will be recognized by professional scientific and educational associations, among them the Canadian Dental Association, which sponsor the council. Two top-award winners at the Second Canada-Wide Science Fair, a boy and a girl will attend the International Youth Science Fortnight in England.

RURAL SCHOOLS AND PUBLIC ATTITUDES LINKED TO DENTIST SHORTAGE IN RURAL ONTARIO

Low rural teaching standards and salaries and public indifference toward the saving of teeth are partly responsible for the shortage of dentists in Ontario's rural areas. So said S. A. MacGregor, professor of Paedodontics at the University of Toronto and chief of Dental Services at Toronto's Hospital for Sick Children, to fifty-three dentists and community leaders assembled on November 23, 1962 at a workshop conference on recruitment and placement of dental graduates in rural Ontario. Dr. MacGregor was keynote speaker at the meeting which was organized by the Ontario Dental Association's Dental Public Health Council.

The participants included dentists from smaller communities who have collaborated with the Ontario Dental Association's Dental Public Health Committee in the recruitment of students; medical officers of health; representatives from public health nursing and public health dentistry; university teachers in dentistry, public health, political economy and sociology; as well as representatives from the Ontario Medical Association, Ontario Division of the Canadian Red Cross, Ontario Department of Education, Ontario College of Education, Ontario Federation of Home and School Associations, Ontario Women's Institutes, rural Ontario secondary schools, Ontario Haemophilic Association, and the Canadian Section of the American Dental Trade Association.

Dr. MacGregor said that of one-hundred and ten Ontario students graduating in 1963, seventy-nine came from Metropolitan Toronto. Of those who come from rural or small town areas, only forty-three per cent return to these areas.

One reason for the shortage of rural dentists is that "the city-bred boy, in spite of the money, cannot be lured away from the comforts of a city house and an . . . office in the plaza," Dr. MacGregor remarked.

But there are other reasons:

Many students who get high marks from rural teachers in their grade 12 Christmas report, subsequently give a much poorer showing in grade 13 departmental examinations and fail to enter university, he said. This suggests either that the grade 13 examination is not a true indication of the student's ability, or that rural and city teaching standards are not comparable.

Dr. MacGregor said he was not suggesting a lowering of students' standards, but a raising of teaching standards. He asked if teaching standards in rural Ontario are adequate to enable students to enter university. And he asked if low salaries and lack of specialists in academic subjects influenced the grade 13 results in rural areas. Dr. MacGregor called for a Royal Commission on rural education to look into the matter.

Turning to public attitudes, Dr. MacGregor pointed out that people in rural areas are not as interested in preventive dentistry as those in cities. Referring to the Ontario Dental Association's dentist placement program, Dr. MacGregor said "In many cases it has been our experience that the desire (of rural communities) to secure a dentist is strong but the desire to support the dentist is feeble." Dr. MacGregor asked whether the present attitude of the rural public with respect to health services encourages young dentists to meet the challenge of rural practice.

Health Minister Matthew Dymond, who opened the conference, told delegates that the provincial government would discuss with the Royal College of Dental Surgeons of Ontario the need for a second dental school in the province, adding that he was empowered by the Ontario government to enter into negotiations to set up such a school. The workshop not only endorsed this suggestion—it suggested that two new dental schools be established.

More than 25 recommendations were made by the workshop. Among them were:

That there is evidence that rural school facilities are inadequate to ensure students getting into university dental courses.

That grade 13 examinations alone should not be considered the best index of a student's potential to enter university and that

research be undertaken to find a better criterion.

That more vocational guidance be introduced into rural schools. Without an increasing number of rural youngsters entering dental schools there seems little hope for dentists to settle in rural areas.

That efforts be made to persuade rural parents to encourage youngsters to take up dentistry as a career.

That hospitals improve their facilities for treating dental patients. Several types of patients, among them paraplegics, the mentally retarded and haemophiliacs, need hospital care while dental treatment is carried out. Yet only a handful of hospitals in the province have dental services and these are not required by the Canadian Council on Hospital Accreditation.

It was recommended also that a survey be carried out to find out exactly what facilities exist for dental services in hospitals. A joint conference of the Ontario Hospital Association and professional bodies was suggested.

Delegates suggested that communities which need a dentist should look upon him as a "small industry," helping him find office and other facilities, to encourage him to locate in the community. John Anders, chairman of the Ontario Dental Public Health Council, pointed out that at present, whereas Toronto has one dentist to every 1,600 people certain rural areas have only one dentist to 16,000. There are at present about 100 Ontario rural communities without a dentist at all.

Delegates urged that it would be "unrealistic to expect to set up proper dental facilities" in communities having less than 4,000 population including their surrounding districts.

At the same time, they urged the dental profession to play the fullest possible part in helping dentists to locate in communities where they are needed. They suggested that a system of dental internships be studied. Under such a system young graduate dentists would be required to serve a year or possibly longer in communities to which they would be assigned, before being allowed to establish in communities of their choice.

Delegates also recommended further study of the possibility of establishing "associated" or group practices in medium-sized communities which would attract young graduates, yet at the same time be reasonably accessible to rural patients.

Recommendations made by the workshop will be studied and implemented as they are shown to be feasible by a permanent executive set up under the Ontario Dental Public Health Council. Members are John Anders of Barrie, P. E. Currie of London,

F. E. Dawe of St. Catharines, E. F. Shau-nessy of Wingham, C. M. Purcell of Pembroke, and F. J. F. Phillips of Brockville.

LABOUR-SPONSORED HEALTH CENTRE FORESEEN IN TORONTO

Comprehensive medical care may be provided for a minimum of 50,000 persons under a program to establish a health centre by organized labour in Toronto, according to a recent report in the *Toronto Globe and Mail*. The planning of the project, which would eventually embrace dental services, has been in progress for eighteen months under the direction of J. E. F. Hastings of the School of Hygiene at the University of Toronto. Dr. Hastings recommended including representatives of the community and of the participating professions as well as of the sponsoring labour group on the board of directors of the proposed health centre.

Under the plan there would be a staff of family practitioners and specialists, including internists, paediatricians, obstetricians, surgeons, ear, nose and throat specialists and radiologists. Most doctors would be paid salaries, but some specialists would work on a fee-for-service or part-time basis.

All forms of service would be covered in the group plan with dental service to be provided in the second stage.

Success of the plan may depend upon response from affiliated locals of the labour council and the outcome of negotiations by the unions to have funds, now provided for welfare fringes, diverted to the health centre plan.

MEDICAL CARE LABELLED AS ONTARIO'S NEXT ELECTION ISSUE

Medical care will be the major issue in the next provincial election, according to a recent article in *Toronto's Globe and Mail*.

Despite Premier John Robarts' insistence that he will not allow this topic to become a prime political issue, nothing he can do short of announcing a medical care plan will

prevent the Liberal and New Democratic parties from building this up as a major election issue, according to the Toronto newspaper.

"Prime Minister John Diefenbaker tried to head off the medicare issue with a Royal Commission on Health," the newspaper stated. "The federal Liberals advocated a confusing package which gave coverage to the young and the old, and little for Mr. In-Between who pays the bills and taxes."

Candidates for both parties suffered on political platforms, June 18 in face of the thundering, unequivocal New Democrats who promised complete medicare now and pointed to Saskatchewan to show that they meant business.

According to the *Globe and Mail*, Premier Robarts is taking the view of the man who must pay the bills. He notes the high cost of government generally and says a full study must be made of health care needs before Ontario decides either way. But whether this will satisfy the buy-now, pay-later attitudes that exist is a major political question mark.

Meanwhile the government is believed to be searching for answers from the Ontario Medical Association, medical prepayment plans, insurance firms, economists and others.



Canadian delegates who attended the recent First National Conference on Administration of Prepaid Dental Care Programs in Seattle, Washington, September 24-26, 1962 included (front l. to r.) R. L. Rasmussen of Calgary, Mrs. B. Isabel Brown of Toronto (director, Bureau of Economic Research, Canadian Dental Association), and H. J. Killas of Vancouver; (rear l. to r.) W. M. Joiner of Vancouver, P. M. Jackin of Winnipeg, E. P. Luxford of Calgary, and W. R. Upton of Vancouver.

International Items

PREDICT SHARP RISE IN PREPAID DENTAL PLANS

A promising future for prepaid dental care programs based on growing public demand during the next ten years was forecast by dental health insurance specialists at the First National Conference on Administration of Prepaid Dental Care Programs held in Seattle, September 24-26, 1962. The meeting was sponsored by Washington Dental Service, the oldest dental service corporation in the United States.

The conference was attended by 110 delegates from at least twenty American states, the U. S. Government and Canada. Canadian observers at the meeting included Mrs. B. Isabel Brown, director of the Canadian Den-

tal Association's Bureau of Economic Research; H. J. Killas, W. M. Joiner and W. R. Upton of Vancouver; E. P. Luxford and R. L. Rasmussen of Calgary; and P. M. Jackin of Winnipeg.

Conference sessions included lectures and panel presentations with questions and discussions from the floor following each. Nationally recognized experts discussed advances in administration and management, including underwriting, claims procedures, professional policies, fee determination and responsibilities of dental directors. Participants were concerned with the basic necessity of maintaining high quality of dental care while finding ways of developing a variety of programs under free enterprise which will extend the benefits of adequate dental care to the whole population. Representatives of dental service corporations, commercial insurance companies and closed panel clinics—the three major types of programs that have developed—participated in the conference.

In a keynote address, C. J. Lynch, a group insurance consultant, noted that rising average income and growing urbanization have

led to an increased demand for dental care. As this demand increases, so will the demand for dental prepayment programs. Dental disease constitutes the most prevalent uninsured health problem to-day. In Mr. Lynch's opinion, a large share of the demand for prepaid dental care plans will come from labour which will want the lowest cost quality dental care possible. Labour will want to know in what way this quality can be assured and safeguarded. Mr. Lynch left little doubt that dental care would be the next segment of total health care to be covered by insurance.

The closing speaker was Carl Sebelius, secretary of the Council on Dental Health, American Dental Association. Dr. Sebelius reviewed the policies of the American Dental Association and stated that closed panel practices should be used only when no other way of providing prepaid dental care is available. These panels are a threat to quality care and to private practice. Dental service corporations and commercial insurance plans should be encouraged instead, Dr. Sebelius asserted. The dental service corporation not only places the reins in the hands of the profession but it also offers the greatest flexibility for making available to the consumer the care he needs.

"Until the public's attitude toward dental health is substantially improved," continued Dr. Sebelius, "and a higher priority is placed on obtaining dental care, dental prepayment will probably be built as a foundation of employee benefits rather than public desire. Because collectively bargained fringe benefits will increasingly extend dental coverage, the (American Dental) Association has developed a separate four-point policy statement on plans for group purchase of dental care as part of employer-employee relationship."

MEXICAN DENTAL CONGRESS SCHEDULED

The seventh biennial national dental congress of the Mexican Dental Association will be held in Mexico City, November 17-23, 1963. There will be scientific papers, forums, panel discussions and seminars. Translations from English and Spanish will be provided.

Members of the Canadian Dental Association wishing to participate in the congress are cordially invited to do so. Further information may be obtained from Dr. R. Sanchez-Woodworth, Asociación Dental Mexicana, Sinaloa No. 9, México 7, D.F., Mexico.

F.D.I. PLANS LARGE SCIENTIFIC SESSION

Biological aspects of prosthetic dentistry, oral health of the aged and microbiology of periodontal disease will be discussed during the scientific program of the 51st annual session of the Fédération Dentaire Internationale scheduled June 29 to July 6, 1963, in Stockholm, Sweden. According to Helge Berggren, chairman of the Swedish organizing committee, other topics will be "The European Common Market and the Dental Profession." Lectures and table clinics, which will be televised, are also planned. Simultaneous translations in English, French and German will be available.

Many social events have been scheduled including a full-day excursion to the famous Stockholm archipelago, performances in the Drottningholm Theatre, and a visit to the world-famous Wasa Museum. Th. Brandrup-Wognsen, F.D.I. president 1957-59, will be president of honour for the session.

FIRST GROUP OF AUXILIARIES GRADUATE IN ENGLAND

The first fifty dental auxiliaries have begun to work under local authority health services in various parts of Great Britain. These young women, all between the ages of 17 and 25, graduated on July 31, 1962 from the two-year training course at the School for Dental Auxiliaries, New Cross General Hospital, London. This program, which is under the direction of Britain's General Dental Council, has attracted more applicants from all parts of the country than can at present be accommodated. Each student receives a maintenance grant of £240 for the first year and £250 for the second year, paid by the Ministry of Health.

The first group of graduates are being allowed to work within the area of their choice—often near their home towns—but in future dental auxiliaries will be required to go where vacancies occur or where a local authority requests their services.

Applicants who wish to train as dental auxiliaries are required to have four or five passes in the General Certificate of Education, including the English language, mathematics and a science subject, but the ruling here is not rigid. Even though they have not

a pass in mathematics they may still be considered on the English language and a science subject among others; and applicants who can provide evidence, apart from the General Certificate of Education, of a good general education, may also be accepted.

A dental auxiliary will earn £525 a year at the commencement of her career with eleven annual increments to £790, subject to such changes in wage structure for this type of work as may from time to time occur. While many are expected to marry early, they will be able to continue working after marriage.

TUFTS DENTAL SCHOOL OFFERS RESEARCH FELLOWSHIPS

Two fellowships intended for graduate dentists interested in research and teaching careers in periodontology are offered by Tufts University School of Dental Medicine, Boston. In addition to participation in an extensive research program, the fellowships offer training in periodontal pathology and an opportunity for preparing for advanced degrees. There is an annual stipend of \$5,000, and the fellowships are renewable. Applications are now being accepted for the period commencing September 1963. Further information may be obtained from I. Glickman, Department of Periodontology, Tufts University School of Dental Medicine, 136 Harrison Avenue, Boston 11, Massachusetts, U.S.A.

Dental Organizations

CALGARY DENTISTS ACTIVE

The Calgary and District Dental Society has commenced a very active year. J. F. Johnston of the University of Indiana School of Dentistry was the guest clinician at a scientific meeting held on October 2. Dr. Johnston

spoke on "Crowns, Bridges and Partial Dentures" and on "Ethics." G. Nikiforuk of the Department of Preventive Dentistry and Division of Dental Research, University of Toronto was a visitor in November when he addressed the Calgary Preventive Dentistry Club on November 3 and the Calgary and District Dental Society on November 4.

U. S. CLINICIAN ADDRESSES EDMONTON DENTISTS

October 4 marked the opening meeting for the current season's program of the Edmonton and District Dental Society. J. F. Johnston of the University of Indiana School of Dentistry was the guest clinician on this occasion. Dr. Johnston chose as his subject, "Various Aspects of Crown and Bridge Prosthesis." During the following three days Dr. Johnston was guest clinician at a post-graduate course offered by the Faculty of Dentistry, University of Alberta.

New members were introduced to the society at a meeting on November 6. S. R. Gelmon of Saskatoon, Saskatchewan was the guest clinician on this occasion. Dr. Gelmon discussed medication for handicapped, apprehensive and nervous patients.

NEWS FROM THE COLLEGE OF DENTAL SURGEONS OF BRITISH COLUMBIA

At the recent November 1962 examinations for practice in British Columbia, seven candidates took the clinical and written tests and in addition one candidate successfully repeated the clinical examinations which he had failed previously. Of the seven who took the complete examinations, four failed to pass. Those who were successful were: D. R. Bonlie, L. A. Fleetwood, J. Peraya and J. K. Philp.

Early in the year the College will conduct a course in dental radiography for dental assistants. To date 216 assistants have made application to take the course, and if they are successful, they will be permitted to take radiographs in the dental office.

Some fifty officials of the Council of the College of Dental Surgeons of British Columbia, the British Columbia Dental Association and the dental societies of the prov-



President J. B. Macdonald of the University of British Columbia (l.) speaks with S. Wah Leung, dean of the university's new dental faculty at a recent reception tendered by the College of Dental Surgeons of British Columbia for the new dean.

ince attended a reception on November 22, 1962 at the new Shaughnessy Golf Club for S. Wah Leung, dean of the dental faculty at the University of British Columbia.

VANCOUVER DENTISTS MEET

At the November 1962 meeting of the Vancouver and District Dental Society, Miss J. E. Schindell made an appeal to the dentists to encourage their assistants to join the Vancouver Dental Assistants' Association, of which she is president.

The essayist was J. L. Bullard, an oral surgeon of Richmond, California. In the afternoon he spoke of challenging surgical problems in the office, and in the evening he showed slides which depicted the preparation of the mouth for dentures, the removal of cysts and the treatment of fractures.

FALL CONVENTION IN THE KOOTENAYS

At the fall convention held in Trail, British Columbia on October 13, 1962, it was announced that a prize of \$50 was being offered for the best job study on the dentist

or the dental hygienist by Grade 10 students in the district. As the job study is part of the regular curriculum for this grade, the prize will stimulate more interest among future citizens in dentistry as a career.

These new officers were elected: N. J. Bedard, Nelson, president; J. F. F. Mykietyn, Trail, vice-president; M. R. Bayes, Castlegar, secretary.

NEWFOUNDLAND DENTISTS HOLD CONVENTION

The annual meeting of the Newfoundland Dental Society was held in St. John's, October 11-13. M. J. Maguire of Gander was elected president. K. Obraczova of Corner Brook became first vice-president, and W. H. J. O'Driscoll of St. John's, second vice-president. B. L. Bowden of St. John's was re-elected secretary and Dr. D. A. Hollett of St. John's was elected treasurer. The immediate past-president is E. P. Kavanagh of St. John's.

Speakers at the annual meeting included James McGrath, Minister of Health for Newfoundland, Fraser Walsh, superintendent of the Mental Hospital of St. John's, Major T. Gaudet of the Royal Canadian Dental Corps, James McCutcheon and J. J. McCarthy of McGill University, M. V. J. Keenan, president of the Canadian Dental Association, and Don W. Gullett, secretary of the Canadian Dental Association who both addressed the closing dinner.

At the formal dinner held on October 13 Dr. Gullett was presented with an honorary life-time membership in the Newfoundland Dental Society.

HALIFAX DENTISTS HEAR C.D.A. PRESIDENT AND SECRETARY

The first meeting of the Halifax County Dental Society for the current season took the form of a reception and dinner at Ashburn Golf and Country Club on October 5. The society's president, Dr. H. F. Taylor and Mrs. Taylor received the guests.

Another meeting of this society was held at the Nova Scotian Hotel on October 17. This meeting was addressed by Mr. W. E. Gore of the Dentists' Supply Company of New York who discussed the selection and

use of artificial teeth for prosthetic appliances.

On November 14 members of the Halifax County Dental Society and the Nova Scotia Dental Association met in joint session at the Lord Nelson Hotel. H. P. MacCormack, president of the Nova Scotia Dental Association, presided at the meeting. Guests of honour on this occasion were M. V. J. Keenan and Don W. Gullett, president and secretary respectively of the Canadian Dental Association. In their addresses, both speakers stressed the importance of supporting the Canadian Dental Association, and keeping informed regarding the actions and policies of the Association as published in the *Transactions*. The profession must demonstrate to government its willingness to assume responsibility and leadership in the provision of dental care for the public. The profession must further be prepared to make concrete suggestions regarding improvement of services to the public, must encourage increased use of auxiliary personnel, and must endeavour to recruit more young people of both sexes to the study of dentistry, the speakers added.

A request was received from the Halifax Dental Assistants' Association concerning the possibility of establishing a training course for dental assistants. This matter is presently under consideration.

QUEBEC COLLEGE OF DENTAL SURGEONS HAS NEW EXECUTIVE

Recent elections by the Board of Governors of the College of Dental Surgeons of the Province of Quebec resulted in the following executive committee which will serve for the next two years:

Henri Brouillet of Montreal, president; D. B. Ward of Montreal, first vice-president; Lorenzo Picard of Sorel, second vice-president; and Robert LeBlanc of Montreal, registrar-secretary. Marcel Archambault of Montreal, Louis Bernier of Quebec City, Roger Charette of Montreal, Victorien Dubé of Montreal, Jean Fontaine of Montreal, Julien Giroux of Sherbrooke, H. T. Oliver of Montreal, and George Zimmerman of Montreal were named councillors. Rémy Langlois of Quebec City was named consultant.

In his valedictory address the retiring president, Rémy Langlois drew attention to various achievements of the College during the past two years. Among these are: adoption of the National Dental Examining

Board of Canada examination to replace the theoretical examination of the Provincial Board of Dental Surgery; full recognition of the dental profession in the new provincial Hospitals Act and preparation and adoption of model by-laws for dental services in hospitals; heartening response to student recruitment activities; preparation and presentation of a brief to the Royal Commission on Health Services; establishment of a joint committee by the College and Dental Technicians Association; a new Workmen's Compensation Commission schedule of dental fees; adoption of a new scale of fees by the College; creation of a news bulletin, "Information" to inform members of the profession of business transacted on their behalf by the College; and the initiation of sickness and accident group insurance for members of the College.



Henri Brouillet

According to a new by-law ratified by the Provincial Board of Dental Surgery, it is expected that by 1964 most final-year dental students will avail themselves of the opportunity of taking the National Dental Examining Board of Canada examination in place of theoretical examinations set by the Board. They will thereby gain the right to apply for a licence to practise in other provinces.

MONTREAL ANNUAL FALL CLINIC

In addressing a luncheon meeting of the Montreal Dental Club's recent 37th Annual Fall Clinic in the Queen Elizabeth Hotel, Montreal, J. E. F. Hastings, associate professor of Public Health and Preventive Medicine at the University of Toronto's School of Hygiene, reported on a six-month

world tour last year under the auspices of the World Health Organization. Dr. Hastings studied health and welfare services in England, Russia, India and Japan.

In these countries there is a tremendous amount of good-will for Canada and the West but this will not last unless the western countries show by their actions that they want them as friends because they are liked and respected for themselves, Dr. Hastings declared. He discussed the medical problems in these countries and stated that in England the major problem is the isolation of the general medical practitioner from his consultant colleagues. The patient is under the care of the general practitioner while at home and on admittance to hospital the consultant takes over.

Two seminars were given at the beginning of the Fall Clinic, thus continuing a policy started last year. The seminars this year were presented by C. Bliss on "Practice Management" and by L. Hirschfeld on "Minor Tooth Movement."

The usual registered clinics were not held this year. In their place a full-day crown and bridge workshop was featured and there were also three general sessions.

The crown and bridge workshop had R. T. Lamb as co-ordinator and moderator and consisted of presentations by local dentists on various aspects of this field. E. R. Ambrose, H. Rosen, D. Kepron, M. Gordon, R. P. Dundass, and R. F. Harvey spoke on tooth preparation, impression technique, occlusal factors, tooth and pontic form, abutment protection, temporary coverage and cementation, and periodontal considerations respectively. Although attempting to cover a very large field within a limited time, the presentations were well received and interest was maintained to the end of the day.

The general sessions featured papers from the Montreal Dental Research Society, W. Harrigan of New York University on exodontia and N. F. Hansen of Indiana University School of Dentistry on periodontal prognosis.

Dr. Harrigan stated that even a minor tooth extraction could have major complications. He advised dentists to consider the general health of the patient and recommended referring him to a specialist if necessary. Patients were also cautioned that even in the same mouth, "different teeth present different problems."

Another speaker, A. E. McCabe, representing the Dental Hygiene League of the Province of Quebec explained that there are now twenty-six communities in the province fluoridating the water supply as compared to only one in 1955.

Scientific motion pictures were shown throughout the Fall Clinic. Table clinics included presentations by students from the

Université de Montréal and McGill University dental schools.

More than one thousand delegates registered for the convention, an all-time record according to J. Vincelli, convention chairman.

JOINT MEETING OF MONTREAL DENTAL SOCIETIES

Members of La Société Dentaire de Montréal, the Mount Royal Dental Society, and the Montreal Dental Club met for their first joint meeting of the current season on November 19, 1962 at the Queen Elizabeth Hotel. I. R. Hardy, professor emeritus of Prosthetic Dentistry at Tufts University School of Dental Medicine, Boston was the guest speaker. Dr. Hardy chose complete prosthodontics as the topic of his address. He discussed aesthetics and articulation in terms of (1) proper selection of teeth based on a record of the patient's natural teeth or on the teeth of a member of the family, and (2) selection of tooth shades and characterization of the denture base. Immediate dentures and rebasing procedures were other topics covered by Dr. Hardy.

M. V. J. Keenan and Don W. Gullett, president and secretary respectively of the Canadian Dental Association, addressed assembled members of the three dental societies at the dinner meeting. Drs. Keenan and Gullett were in Montreal in connection with presidential visitations to dental groups in eastern Canada.

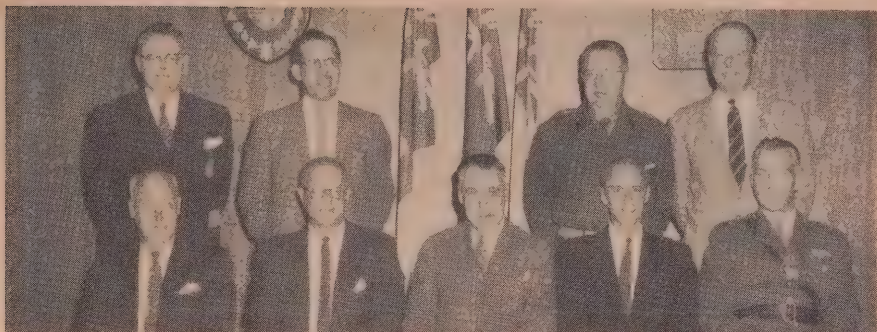
SASKATCHEWAN COLLEGE APPOINTS NEW OFFICERS

The Council of the College of Dental Surgeons of Saskatchewan met in Regina, November 17-18, 1962. There was a full attendance along with several members of the college at various sessions.

For the year 1963 F. S. W. Green was elected president; A. F. Muirhead vice-president and F. R. Smith was re-appointed as secretary.

W. F. Hancock was re-appointed to the National Dental Examining Board of Canada. A. D. Leask having asked to be relieved as representative to the Board of Governors of the Canadian Dental Association, R. O. Brett was appointed in his stead.

C. D. Bricker of Grenfell was elected to



Pictured during the executive meeting of the Royal Canadian Dental Corps Association at the Royal Canadian Dental Corps School, Camp Borden, Ontario, October 5-7, 1962, are the following officers: Standing (l. to r.) Col. C. E. Woods, Ottawa; Lt.-Col. G. L. Ramsay, Saint John; Col. J. E. Merritt, Halifax; and Col. C. B. H. Climo, Ottawa. Seated (l. to r.) Lt.-Col. W. G. Campbell, Winnipeg; Lt.-Col. N. L. Simon, Hamilton; Col. J. F. Edgecombe, Saint John, Colonel Commandant of the Royal Canadian Dental Corps; Lt.-Col. J. S. Goodfellow, Calgary; and Col. I. A. L. Millar, Directorate General of Dental Services, Ottawa.

honorary life membership in the College as of January 1, 1963.

Dr. Hancock, as representative of the College on the National Dental Examining Board, reported on the problems involving policies of the Board and its future. He offered reasons for the belief that the Board performs a very important function relative to the level and standard of dental education in Canada. Conjoint (dental faculties and N.D.E.B.) examinations were discussed and the following resolution was adopted: "THAT this Council go on record as favouring coincidental examinations with the N.D.E.B. for all graduates of Canadian dental faculties."

The amount contributed annually towards scholarships at the University of Alberta and the University of Manitoba was each increased from \$150 to \$300.

Royal Canadian Dental Corps

CORPS CONFERENCE HELD IN OTTAWA

Senior officers of the Royal Canadian Dental Corps (Regular) in Canada gathered in

Ottawa, December 3-5, 1962 to participate in the Annual Corps Conference. Held under the direction of Brigadier K. M. Baird, Director General of Dental Services for the Canadian Forces, the formal meetings were chaired by Colonel G. B. Shillington, Deputy Director General of Dental Services. Several papers were presented and discussion held on subjects related to the operation of the Royal Canadian Dental Corps and the commanding officers later had the opportunity to confer individually with the directorate staff on matters relating to their particular units.

A formal supper dance on December 4 at the Army Headquarters Officers' Mess highlighted the social program. Commanding officers attending were: Col. C. E. Purdy, the Royal Canadian Dental Corps School, Camp Borden; Col. B. P. Kearney, No. 11 Dental Company, Edmonton; Col. A. T. Roger, No. 12 Dental Company, Halifax; Col. A. C. Leman, No. 13 Dental Company, Trenton; Lt.-Col. R. B. Jackson, No. 14 Dental Company, Winnipeg; Lt.-Col. J. G. Butler, No. 15 Dental Company, Montreal; and Major J. W. Fletcher, No. 1 Dental Equipment Depot, Camp Petawawa.

CAPT. LOVELY RELEASED

Following a tour of duty at the Canadian Forces Hospital at Halifax, Capt. F. W. Lovely has taken his release from the Corps

and has been appointed to the Oral Surgery Department of the Dalhousie University Faculty of Dentistry.

DIRECTOR GENERAL OF DENTAL SERVICES REPRESENTED AT MONTREAL FALL CLINIC

Lt.-Col. J. G. Butler, Commanding Officer of No. 15 Dental Company, Montreal attended the Annual Montreal Fall Clinic, October 29-31, 1962 as the official representative of the Director General.

DENTAL OFFICER SUBSIDIZATION AT RECORD LEVEL

There are ninety-six dental undergraduates attending Canadian universities who are being subsidized under plans sponsored by the Department of National Defence. This represents an increase of 21 students over last year. There were forty-nine applications for the 35 vacancies allotted for 1962 in the Dental Officer Subsidization Plan.

DUTY TRIP TO CONGO

Lt.-Col. L. G. Craigie, Commanding Officer of No. 35 Field Dental Unit, with headquarters in Metz, France, made a recent visit to Leopoldville, Congo to investigate the requirement for dental services for Canadian troops in the area.

ASSISTANT DIRECTOR OF DENTAL SERVICES (MILITIA) APPOINTED

Army Headquarters has announced the promotion of Lt.-Col. C. E. Woods of Ottawa to the rank of colonel and his appointment as Assistant Director of Dental Services on the Militia Advisory Staff at Central Command.

A native of Ottawa, Col. Woods graduated in dentistry in 1942 from the University of Toronto and received his commission in the Canadian Dental Corps. After serving overseas for two years he was released in February 1946. In March 1949, Col. Woods joined the Canadian Army (Militia) and served with No. 54 Dental Unit in Ottawa for over ten years, the last four as Commanding Officer of the unit. In December 1959 he was transferred to the Supplementary Reserve and was appointed Deputy Assistant Director of Dental Services for Eastern Ontario.

OFFICERS ATTEND COURSES

The following dental officers have recently attended or are attending courses as indicated:

Lt.-Col. N. A. Butcher—Complete Prosthodontics, University of Michigan; Major D. H. Skinner—Advanced Dentistry, Walter Reed Army Medical Centre, Washington; Major A. G. Taylor—Crown and Bridge Prosthodontics, U. S. Naval Dental School; Major P. L. Falkner—Oral Surgery, U. S. Naval Dental School; Major T. D. Cobb and Major



Completing the series of photographs of commanding officers of the Royal Canadian Dental Corps Militia units located across Canada, portrayed in this issue of the Journal of the Canadian Dental Association is Maj. S. J. Gouroff of No. 53 Dental Unit in Montreal.



Shown presenting Capt. A. R. Frechette, D.C., U.S.N., Commanding Officer, U.S. Naval Dental School, Bethesda, Maryland with a framed Royal Canadian Dental Corps crest on behalf of the Director General of Dental Services for the Canadian Forces is Lt.-Col. J. W. Turner, R.C.D.C. Exchange Officer on staff of the U.S. Naval Dental School. This crest serves as memento of the strong ties between the two dental corps and marks the fiftieth anniversary of the U.S. Naval Dental Corps. Also participating in the ceremony are (l. to r.) Capt. M. G. Turner, D.C., U.S.N., Executive Officer, U.S. Naval Dental School; Capt. G. W. Ferguson, D.C., U.S.N., Head, Officer Education and Training Department; and Rear Adm. R. B. Brown, M.C., U.S.N., Commanding Officer, National Naval Medical Centre.

R. J. Bryant—Oral Surgery, University of Michigan; Major L. A. Richardson and Major F. D. Charman—Oral Surgery, Royal College of Surgeons, London, England; Major E. J. C. Small—Oral Surgery, Ent Air Force Base; Capt. V. M. McMaster—Partial Prosthodontics, U. S. Naval Dental School; Capt. L. A. Reynolds—Oral Medicine, Ohio State University; Capt. B. A. Gaudet—Oral Pathology, U. S. Naval Dental School; Capt. D. G. Gardner—Periodontics, U. S. Naval Dental School.

Public Health

ONTARIO, ALBERTA AND QUEBEC CENTRES ACT ON FLUORIDATION

Windsor, Sarnia, London, Hamilton, Toronto and Ottawa were among the Ontario cities

holding fluoridation plebiscites on December 3 and 5, 1962, in conjunction with local municipal elections. Local dental societies played an active role in campaigns to support the measure and individual dentists participated by urging their friends, neighbours and patients to vote for fluoridation. The results were favourable in Toronto and Windsor but fluoridation failed to secure the necessary majority in Ottawa, Sarnia and Hamilton. Toronto expects to fluoridate its water by May 1963. About 1½ million city and suburban residents are served by the city's water supply.

Ontario legislation provides for fluoridation either by decision of municipal councils or by plebiscites. If ten per cent of the voters in a municipality petition for a plebiscite, the question must be put to a public vote and the results are binding. A simple majority is required for approval.

In Windsor, the water was fluoridated earlier this year by council decision and a plebiscite at election time was ordered even though petitioners did not equal the required ten per cent. In Metropolitan Toronto, each of the thirteen area municipalities conducted a plebiscite on December 3.

After several months of frustrating, unavoidable delays, fluoridation became an accomplished fact in Fort Saskatchewan, Alberta early in October.

Fluoridation was also a recent election



National headquarters of the Canadian Dental Association demonstrated its support for fluoridation in the recent plebiscite on this measure in Toronto by means of this prominently displayed sign erected over the front entrance. A similar sign was displayed by the Royal College of Dental Surgeons of Ontario, an immediate neighbour of the Canadian Dental Association.

issue in Alberta. Of four centres which voted on fluoridation of the water supply, only Milk River, in southern Alberta, approved. The measure failed to gain the necessary two-thirds majority in Jasper Place, passing by 55.87 per cent. Camrose and Rocky Mountain House also rejected the measure.

Twenty-six communities in the Province of Quebec now fluoridate their water supplies, according to the Dental Hygiene League of the Province of Quebec. The largest city in that province to do so is Trois Rivières which started to fluoridate in August 1962.

Research

RESEARCHERS RECOMMEND FLUORIDATION

Fluoridation has been recommended officially by the Second Canadian Conference on

Dental Research. About 40 dental research workers, representing all dental schools in Canada, unanimously adopted the statement which appears below.

Besides progress reports of research projects being conducted in dental schools, the conference heard J. B. Macdonald, president of the University of British Columbia and noted dental researcher, speak on "Science and the Root of all Evil." James Zimmerman of Calgary, president-elect of the Canadian Dental Association, addressed a luncheon meeting during the conference.

The scene of the conference was the Banff School of Fine Arts at Banff, Alberta, October 9-11. C. W. B. McPhail, R. V. Blackmore and C. R. Castaldi, all dental faculty staff members at the University of Alberta, were in charge of local arrangements. The conference was financed by grants from the National Research Council's associate committee on dental research and the Procter and Gamble Company of Canada.

The text of the fluoridation statement was as follows:

Tooth decay needlessly affects the majority of children and adults in Canada, and continues to be one of the major public health problems of to-day.

Studies on fluoridation extending over a period of thirty years have proved beyond any doubt that adjustment of the fluoride content of communal waters to contain one part fluoride to one million parts of water causes no ill effects, and is effective in reducing tooth decay. The studies indicate that fluoridation benefits children and that the benefits extend into adult life.

The participants in the Second Canadian Conference on Dental Research unanimously recommend that wherever feasible communities across Canada adopt fluoridation as a safe and effective method for improving dental health.

ADVOCATE INCREASED FINANCIAL SUPPORT FOR DENTAL RESEARCH

Two prominent dental leaders urged increased support for dental research in Canada, when they addressed delegates attending the Second Canadian Conference on Dental Research at Banff, Alberta, October 12, 1962.

James Zimmerman, president-elect of the Canadian Dental Association, voiced dentistry's concern with manufacturers of biscuits, cereals, cakes, confections, jams, carbonated beverages and refined sugars, because consumption of these products is a direct factor in dental caries.

"It is rather significant," said Dr. Zimmerman, "that all current and capital expenditures for research projects are deductible for income tax purposes, whether such research is pursued within the plant, or carried out at universities, schools, or special research establishments."

Yet the absence of research in these food industries and their lack of support for established research organizations manifests an apathy and a lack of interest in the welfare of the ultimate consumers, Dr. Zimmerman declared.

Canada spent about 78 million dollars on research during the past year. "Compared to the same level of research in the United States, Canada should spend 290 million dol-

lars or four times as much, and to equal Great Britain, we should spend 220 million dollars, or three times as much," Dr. Zimmerman explained.

J. B. MacDonald, president of the University of British Columbia, called on the Canadian Government to increase its contribution to research.

Research is big business to-day, although Canada is far behind the United States, Dr. MacDonald declared.

Harvard University, one of the largest and richest private universities in the United States, has 25 per cent of its budget paid by the government. Nevertheless, Harvard University is not concerned with government control, Dr. MacDonald stated.

book reviews

AN INTRODUCTION TO THE STUDY OF DISEASE

William Boyd. Philadelphia, Lea & Febiger, 1962. (Available from the Macmillan Company of Canada Limited, Toronto) 478 p. Illus. \$8.00

In the preface to the fifth edition of his book, the author states: "The present book is merely a general introduction to the study of disease, an airplane view of that subject, its causes and the bodily changes which accompany it." Despite this remark the reader's first impression is the detailed manner in which the material is introduced and developed. It is indeed a heroic and at the same time a meticulous work covering an extremely broad field. The basic sciences are reviewed in such a concise and pithy manner that the pathologist cannot fail to appreciate the exhaustive efforts made to compress such an extensive work into four hundred and seventy-eight pages.

The book is divided into two main sections.

Part One, "Some General Principles" consists of fourteen well proportioned chapters.

The sections which deal with cytology in health and disease, physiology and the immediate and remote causes of various pathological processes are fundamental, accurate and above all, readable. A chapter on "A Historical Outline" is unique in a volume of this kind. It traces the gradual development of medical science from primitive times to the most recent concepts of twentieth century scientific thought. Most of the remaining chapters are concerned with the aetiology of morbid change.

There are fifteen chapters in Part Two. The heading for this section, "The Organs and their Diseases" describes accurately what is to be found in the following pages. As throughout the entire book, Dr. Boyd has developed the sub-sections with clarity and purpose. The last chapter is devoted to "The Care of the Patient." At first glance it would seem that little space is given to the important subject of diagnosis. Yet, according to the title of the book, this text is "An Introduction to the Study of Disease." The section on Diagnosis is therefore adequate for the present purpose and this is true also for the remaining portion of the chapter on Treatment.

The Table of Contents is attractive being without tedious sub-headings. The sub-headings are at the beginning of each chapter and they are terse and accurately arranged.

In these days of digests and summaries in all fields, it is gratifying to note from the sub-headings what is being treated in each chapter.

A feature which will appeal to students is two pages of prefixes and suffixes with their meaning and application. Perhaps, at times, the venerable practitioner will profit from a hasty glance at these final pages.

A. Borden Haverstock

MODERN TRENDS IN ANAESTHESIA

F. T. Evans and T. C. Gray. London, Butterworths, 1962. (Available from Butterworth & Co. "Canada" Ltd., Toronto) 219 p. Illus. \$10.00

This text contains eight chapters written by seven contributors, each writing on some aspect of the biochemistry of anaesthesia. It is designed for the specialist in anaesthesia who is required to administer anaesthetics for complicated and often lengthy procedures. These include hyothermia, cardiac bypass using a heart-lung machine, and other cases requiring several hours of anaesthesia for the patient during which electrolyte balance becomes a very important factor. It is of little value to the occasional anaesthetist or for the dental anaesthetist who confines his work to ambulatory patients.

Chapters one and two deal with correct nomenclature and definitions, the measurement of bicarbonate, CO_2 , pH, PCO_2 , etc., and unless the reader is well trained in pharmacology, physiology and biochemistry, it takes some time to understand the formulae and graphs presented. Chapter three deals with hypercapnia, the problems associated with it, its effect, and the recognition of hypercapnia when it occurs.

Chapter four on hyperventilation is interesting in that it shows that respiratory alkalosis is more easily corrected by the body than the acidosis of respiratory depression, and that hyperventilation actually assists the anaesthetic agent.

Chapters five and six deal with acid-base balance during and after hypothermia and cardiac bypass.

Chapter seven is of interest to both the occasional anaesthetist and the specialist. It deals with adreno-cortical mechanisms and the effects of steroid therapy on a patient's response to stress.

Chapter eight, dealing with the cholinesterases, also has some interesting data dealing with the hydrolysis of procaine and other local anaesthetics.

The following conclusions were reached by the reviewer: (1) This book is intended for the specialist in anaesthesiology. (2) The dental anaesthetist giving ambulatory anaesthesia may find some points of interest to him, but will have to wade through many pages of complicated formulae and graphs to weed out these points. (3) The book is of no value to the general practitioner of dentistry who confines his anaesthetic procedures to the use of standard dental local anaesthetic solutions.

E. N. Cole

ORTHODONTIA IN EVERYDAY PRACTICE

R. Hotz. (Translated by R. J. Fanning) First Edition in English based on the Third German Edition. Montreal, J. B. Lippincott Co., for H. Huber Verlag (Berne, Switzerland), 1961. 406 p. Illus. \$16.00

This volume from Switzerland has been written to give instruction and guidance to the dentist who includes limited orthodontic procedures in his general practice. For handy reference purposes the text has been kept brief (398 pages), but has been plentifully illustrated (375 photographs).

It is noted in the introduction that American and European viewpoints differ regarding the extent and aim of treatment. The latter holds that treatment should be as simplified and practicable as possible so that large numbers of dentists can provide partial service to all, rather than complicated to the point where correction must be confined to the specialist ministering to the favoured few. If this point is borne in mind during the perusal of the book the reader will find much valuable food for thought.

Mechanics are restricted to the use of such removable devices as the expansion plate, the bite plate, the vestibular plate, the incline plane, the monobloc, and the propulsor. Only one fixed appliance, the lingual arch, is discussed in any detail. The chapter on technique is very brief and apparently intended as a supplement to the chapters on treatment, rather than to serve as a manual

for teaching step-by-step fabrication of apparatus. However, the North American dentist seeking information on European methods will find the chapters on treatment, serial extraction, and damage by accident very rewarding, as they discuss routine problems, limitations, and failures with a frankness found in very few of the orthodontic texts published on this side of the Atlantic Ocean. On this continent authors usually emphasize ideal treatment in moderate malocclusions and sidestep discussion of limited objectives in extreme cases. For this reason the book is valuable reading for both undergraduate student and practising specialist as well as the family dentist.

M. R. Culbert

MANAGEMENT OF TEMPOROMANDIBULAR JOINT PROBLEMS

A. S. Freese and P. Scheman, St. Louis.
C. V. Mosby Co., 1962. 235 p. Illus. \$8.50

This text presents throughout its fifteen chapters, current knowledge and theory relating to the temporomandibular joint. The chapters have been divided between the two authors, Scheman having written the chapters on anatomy, embryology, physiology, pathology and treatment of anterior dislocations while Freese has contributed chapters on the myofascial trigger mechanism, diagnosis and treatment of the occlusal problem, occlusal rehabilitation and radiology. Dr. Freese has also contributed his original findings on Costen's syndrome. The two authors, combined on the remaining chapters.

The temporomandibular joint sounds are described and analyzed and pictorial and anatomical explanations are offered for the various categories of sounds. Emphasis is placed on the part played by the disharmony of the muscular action of the superior and inferior fasciculi of the external pterygoid muscle in the production of these sounds.

The conclusion is then drawn that the treatment must consist of retraining these muscles and methods for so doing are outlined. This is supplemented by correction of occlusal disharmonies but the latter is given a role of secondary significance.

The mechanics of the temporomandibular articulation, so well expounded by Carl-Herman Hjortsjö, are elaborated and are accompanied by good schematic drawings which serve well to illustrate the principles involved.

The various forms of pathology found in relation to the joint are reviewed and interesting case histories are presented to illustrate and dramatize the author's designation of "Puzzling and unusual causes of arthritis in the temporomandibular joint."

A method of differential diagnosis of joint pain is presented and physical signs found in the clinical examination of the temporomandibular articulation are described. Possible causes of referred pain in the region of this joint are postulated, along with a new concept of Costen's syndrome which may serve to help clear the air of mystery and doubt about this entity.

The role of occlusion in this overall problem and the equilibration of it are discussed in detail. The authors very properly lay great stress on the somatic and psychic implications of this procedure and caution wisely about the dangers of its misuse. Again, good photographs serve to illustrate well the subject at hand.

Fifty-nine of the text's 229 pages are given over to the subject of occlusal rehabilitation, including the indications for its use and the actual step-by-step technique of executing this difficult form of specialized operative dentistry.

Finally, two short chapters on temporomandibular joint radiology and electromyography bring the book to a close.

This textbook, of interest to dental student, general practitioner, and specialist alike, is well written, attractively bound and small in size (5" x 8"). Its concise form and logical presentation encourage its endorsement. This reviewer considers this book a very worthwhile addition to the literature on this challenging area of interest and recommends it unhesitatingly.

A. E. Swanson

C. D. A. Councils, Committees and Sections. • Over two hundred dentists participate voluntarily in the almost twenty councils and committees of the Canadian Dental Association. Others are active in the Association's four sections: Oral Surgery, Orthodontics, Periodontics and Dentistry for Children.

additions to the library

AMERICAN DENTAL ASSOCIATION. Handbook for dentists; a speaker's guide. 1961 edition. 63 p. illus. \$2.00

DENTAL CLINICS OF NORTH AMERICA, November 1962. Symposia on I. Psychology in dentistry. II. Removable partial dentures. Philadelphia, Saunders. Pages 578-905.

FAUST, H. E. Crown and bridge technique manual. The Overbeck Co., Ann Arbor, Mich. 1959. 131 p. illus. \$5.50

GEOFFRION, P. Clinical application of the twin-wire mechanism. Paris, Julien Prélat, 1962. 227 p. illus. \$14.75

HERBERT, W. E. and VALE, W. A. Operative dental surgery. 8th ed. London, Edward Arnold, 1962. 523 p. illus. \$11.70

KRAUS, B. S. and RIEDEL, R. A. Vistas in orthodontics. Philadelphia, Lea & Febiger, 1962. 397 p. illus. \$11.00.

MORLEY, M. E. Cleft palate and speech.

5th ed. Edinburgh, Livingstone, 1962. 279 p. illus. \$4.95

MUHLEMANN, H. R. and KONIG, K.G., ed. Caries symposium Zürich; the present status of caries prevention by fluorine-containing dentifrices. Proceedings of an International Symposium, November 2 and 3, 1961, University of Zürich, Dental Institute, Experimental Caries Research Laboratory. Berne, Hans Huber, 1961. 174 p. \$8.50

ROYDHOUSE, R. H. Materials in dentistry, Chicago, Year Book, 1962. 210 p. illus. \$5.25

SASSOUNI, V. The face in five dimensions. Morgantown, School of Dentistry Publication, West Virginia University, 1962. 410 p. illus. \$16.20

THUROW, R. C. Technique and treatment with the edgewise appliance. St. Louis, Mosby, 1962. 225 p. illus. \$11.35

WEST, G. I. The dental assistant's handbook. 3rd ed. London, Heinemann, 1962. 128 p. illus. \$3.15

in memoriam

J. M. LEDERMAN—Dr. J. M. Lederman of Winnipeg, Manitoba, died on October 28, 1962. Dr. Lederman was professor and head of the Department of Pathology and secretary to the Faculty of Medicine, University of Manitoba. The son of a Saskatchewan dentist, Dr. Lederman was

associated in various ways with the dental profession over the years, particularly during the early years of the Faculty of Dentistry, University of Manitoba. The Journal is indebted to Dr. J. R. Trott for the following appreciation of Dr. Lederman:

"One wonders what twist of fate placed this son of a Saskatchewan dentist in the position to watch over and help the foundation of the new Faculty of Dentistry in Manitoba. At the age of 50 and after a relatively short illness, Dr. Lederman died on October 28 in the Winnipeg General Hospital, survived by his wife, two sons and a daughter.

"His services to medicine as professor and head of the Department of Pathology, and as secretary to the Faculty of Medicine will long be remembered by his medical colleagues, for he had established a nation-wide reputation in his chosen fields of teaching and pathology.

"The Faculty of Dentistry, however, was conceived and brought into being within the last few years of Professor Lederman's life. As we in the Faculty of Dentistry gathered in Winnipeg, few knew or could even guess that the man who cheerfully and tactfully spared neither himself nor his department to guide, help and advise us, already knew that his fate was sealed. His home was a gathering place for those of us who were strangers to Canada. There we were made to feel not only at home but also a part of his circle of professional acquaintances. He was generous in making sure that we had an ever enlarging circle of friends in Winnipeg and in Canada. In his office he could always iron out problems of every shape and form. Years of experience in handling a department, coupled with a generous heart, an incisive mind, a natural charm and tact, and a clear economical use of language, always made it a pleasure to seek his counsel. At the board table, he gave his views quietly and expertly, always getting to the root of the problem with the minimum of effort.

"The first three classes of dental students at this school felt privileged to have such an outstanding man as this teacher in pathology and we on the dental staff are deeply indebted to him in countless ways both large and small for helping to launch the new school. His charm, wit, knowledge and experience will be greatly missed from our group."

ARTHUR WELLESLEY ALCOMBRACK—Dr. A. W. Alcombrack of Toronto died on October 24, 1962. He studied at the Royal College of Dental Surgeons of Ontario and graduated in 1921. Dr. Alcombrack practised in Toronto until his retirement in 1960.

JAMES WELDON CORAM—Dr. J. W. Coram of Erindale, Ontario died on October 27, 1962. He was 82. Dr. Coram was born in Rockwood, Ontario in 1880. He studied at the Royal College of Dental Surgeons of

Ontario and graduated in 1906. He was a life member of the Royal College of Dental Surgeons of Ontario and honorary registrant of the Ontario Dental Association. Surviving is one daughter, Mrs. Gordon Hagerman of Ohio.

DOUGLAS MORTIMER FOSTER—Dr. D. M. Foster of Guelph, Ontario died on November 10, 1962. He was 84. Dr. Foster was born in Guelph, Ontario in 1878. He studied at the Royal College of Dental Surgeons of Ontario from which he graduated in 1900. In 1950 he became a life member of the Royal College of Dental Surgeons of Ontario. He was connected with the Home-wood Sanatorium of Guelph and the Ontario Reformatory at Guelph. Besides his wife, Vera, he is survived by one daughter, Mrs. Ida Seville of Guelph and one son, Wing Cmdr. W. M. Foster of Tacoma, Washington.

GORDON KITCHENER DOAN—Dr. G. K. Doan of Toronto, Ontario died on November 24, 1962. He was 47. Born in Peterborough, Ontario in 1915, Dr. Doan graduated from the University of Toronto in 1940 and practised in Toronto until 1961 when he joined the staff of Sunnybrook Hospital. During World War II he served with the Canadian Dental Corps. Besides his wife, Avice V. he is survived by two sons, G. Kitchener Doan and Robert E. Doan.

WILLIAM ROLLAND MILLS—Dr. R. M. Mills of Toronto, Ontario died on November 21, 1962. He was 61. Born in Waterford, Ontario in 1901, Dr. Mills graduated from the Royal College of Dental Surgeons of Ontario in 1925. He practised in the Parkdale district of Toronto and served with the Canadian Dental Corps in World War II. He is survived by his wife, Marjorie and two sons, John Marston Mills and William Gordon Mills.

ALEXANDER JAMES SAICH—Dr. A. J. Saich of Victoria, British Columbia died on November 11, 1962. He was 79. Dr. Saich was born in Bruxton, Surrey, England in 1883. He received his early education in the province of Manitoba and received his dental training through apprenticeship graduating from the College of Dental Surgeons of Saskatchewan in 1919. He practised at Quill Lake and Biggar, Saskatchewan and in Victoria, British Columbia. He was historian of the Victoria Dental Society. Dr. Saich served in World War I and later in World War II as major in the Canadian Dental Corps. He is survived by his wife and one daughter, Mary.

announcements

CONVENTIONS OF THE CANADIAN DENTAL ASSOCIATION

1963	Toronto, Ontario	May 19-22
1964	Edmonton, Alberta	June 28-July 1
1965	Quebec City, Quebec	May 30-June 2

FUTURE EVENTS

<i>Date</i>	<i>Function</i>	<i>Location</i>	<i>Officer</i>	<i>Address</i>
Feb. 16-23, 1963	Second Caribbean Dental Convention	Trinidad Hilton Hotel, Port-of- Spain, Trinidad	Dr. A. V. Awon	43-45 Frederick Street, Port- of-Spain, Trinidad
March 28-29, 1963	Alberta Dental Association	Hotel Palliser, Calgary	Dr. D. L. Thompson	206 Medical Arts Building, Calgary, Alberta

POSTGRADUATE AND REFRESHER COURSES (CANADA)

TORONTO—The Department of Orthodontics, Faculty of Dentistry, University of Toronto offers a postgraduate course in **ORTHODONTICS**, March 4-8, 1963. This course for the general practitioner will comprise a review of the anatomical structure and development of the head and jaws, normal occlusion and the aetiology of malocclusion. Modern methods for the interception of malocclusion will be emphasized. Laboratory and clinical periods will permit the construction and manipulation of appliances as well as patient examination. The course will be directed by Dr. D. G. Woodside. Tuition fee \$100. Enquiries and requests for application forms should be directed to the chairman, Division of Postgraduate Studies, Faculty of Dentistry, University of Toronto, 124 Edward Street, Toronto 2, Ontario.

POSTGRADUATE AND REFRESHER COURSES (U.S.)

COLUMBIA—March 7-9, 1963—Temporomandibular Joint Disorders
COLUMBIA—March 25-29, 1963—Edgewise Appliance Therapy
NEW YORK—March 13-15, 1963—Dental Obturators
NORTHWESTERN—March 4-5, 1963—Periodontics for the General Practitioner
NORTHWESTERN—March 25-28, 1963—Complete Denture Procedures
OHIO STATE—March 4-8, 1963—Endodontics
PENNSYLVANIA—March 4-6, 1963—Refresher Course in Oral Hygiene
PENNSYLVANIA—March 4-8, 1963—Clinical and Microscopic Oral Pathology
PENNSYLVANIA—March 18-22, 1963—Practical and Simplified Procedures in Crown and Bridge Prostheses
TEMPLE—March 6-7, 1963—Electronic Electrosurgery
TEMPLE—March 9, 1963—Dentistry for Children
TEMPLE—March 13, 1963—Intraoral Roentgenologic Technique
TEMPLE—March 18-22, 1963—Advanced Surgical Techniques in Periodontal Therapy
TUFTS—March 5-6, 1963—Advanced Periodontal Techniques
TUFTS—March 7-8, 1963—Full Mouth Reconstruction
TUFTS—March 22-24, 1963—Gnathology
TUFTS—March 25-27, 1963—Quadrant Inlays
TUFTS—March 28-29, 1963—Class V Gold Foils
YESHIVA—March 20, 1963—Dental Materials
YESHIVA—March 29, 1963—Restorative Dentistry

Note • Due to lack of space the Journal cannot accommodate all announcements of foreign dental meetings and postgraduate and refresher courses. Readers are invited to write to C.D.A. headquarters for information concerning unlisted meetings and courses. Further information concerning listed meetings and courses should be sought from the sponsoring institutions.

cda retirement savings plan plan d'épargne-retraite adc

Statement as of November 30, 1962 Relevé au 30 novembre 1962

The Canadian Dental Association Retirement Savings Plan provides dentists in Canada with a flexible method of investing savings on which they may obtain tax deferment. Three separate investment funds are available to participants, namely a Government Bond Fund, a Corporate Bond Fund and a Common Stock Fund.

GOVERNMENT BOND FUND

The Government Bond Fund is invested in Canada, provincial, and municipal bonds and mortgages guaranteed under the National Housing Act. The unit price reflects accumulated income and fluctuations in interest rates.

Market value of fund	\$260,754
Unit value of fund	\$11.921

CORPORATE BOND FUND

The Corporate Bond Fund is invested in fixed income obligations of companies incorporated in Canada, the United States or the United Kingdom and in conventional mortgages. The unit price reflects accumulated income and fluctuations in interest rates.

Market value of fund	\$451,895
Unit value of fund	\$12.533

COMMON STOCK FUND

The Common Stock Fund provides a medium for investing in equities and for participating in the long-term growth of the economy. The unit value reflects changes in the stock market prices and the general economic conditions together with accumulated income.

Market value of fund	\$1,031,288
Unit value of fund	\$14.872

Further information can be obtained from the Canadian Dental Association Retirement Savings Plan, 2249 Yonge Street, Toronto 7, Ontario or from the nearest branch of the Royal Trust Company.

Le programme d'épargne-retraite de l'Association dentaire canadienne procure aux dentistes du Canada un moyen souple de placer leurs épargnes tout en bénéficiant d'un retardement d'impôt. Trois fonds de placements distincts sont à leur disposi-

tion, à savoir: un fonds d'obligations gouvernementales, un fonds d'obligations corporatives et un fonds d'actions ordinaires. Les participants peuvent varier leurs contributions entre les fonds, ou encore effectuer le transfert d'un fonds à un autre sans être sujets à l'impôt.

FONDS D'OBLIGATIONS GOUVERNEMENTALES

Le fonds d'obligations gouvernementales est investi dans des obligations et débetures du Canada ou garanties par celui d'une province du Canada ou d'une municipalité et d'hypothèques garanties en vertu de la Loi nationale sur l'habitation. Le prix unitaire reflète le revenu accumulé et les fluctuations des taux d'intérêt.

Valeur du fonds au marché	\$260,754
Valeur unitaire du fonds	\$11.921

FONDS D'OBLIGATIONS CORPORATIVES

Le fonds d'obligations corporatives est placé dans des obligations à revenu fixe de sociétés incorporées au Canada, aux Etats-Unis ou dans le Royaume-Uni et dans des hypothèques conventionnelles. Le prix unitaire reflète le revenu accumulé et les fluctuations des taux d'intérêt.

Valeur du fonds au marché	\$451,895
Valeur unitaire du fonds	\$12.533

FONDS D' ACTIONS ORDINAIRES

Le fonds d'actions ordinaires procure un moyen de placement sous forme d'avoir et de participation dans la croissance à long terme de l'économie. Les placements dans des sociétés canadiennes prédominent mais des investissements peuvent être faits à l'extérieur du Canada afin de profiter d'occasions particulièrement intéressantes. La valeur unitaire reflète les fluctuations des prix du marché, la situation économique générale ainsi que le revenu accumulé.

Valeur du fonds au marché	\$1,031,288
Valeur unitaire du fonds	\$14.872

On peut obtenir d'autres renseignements en s'adressant au Plan d'épargne-retraite de l'Association dentaire canadienne, 2249 rue Yonge, Toronto 7, Ontario ou à la succursale la plus rapprochée de la Royal Trust Company.

Common stock fund as at November 30, 1962 • Fonds d'actions ordinaires au 30 novembre 1962.

Description	Number of shares Nombre d'actions	Value Valeur
Canadian stocks • Actions ordinaires canadiennes		
Banks and Finance • Banques et finance		
Bank of Montreal	800	51,700
Royal Bank of Canada	550	42,488
Industrial Acceptance Corp.	1,100	28,188
Beverages • Breuvages		
Canadian Breweries	3,700	38,850
Hiram Walker Gooderham & Worts	700	38,150
Forest Products • Produits forestiers		
Dominion Tar & Chemical	1,500	26,625
Great Lakes Paper	1,000	17,125
Price Bros.	360	13,230
Iron and Steel • Industrie lourde et de l'acier		
Algoma Steel	800	35,800
Steel Company of Canada	2,200	39,600
Merchandising • Détaillants		
Simpsons	585	17,550
Geo. Weston, Class "B"	1,300	26,975
Metals • Métaux		
Aluminium Ltd.	1,095	26,964
International Nickel	695	48,389
Miscellaneous • Divers		
Canadian Pacific Railway	585	14,113
Moore Corporation	400	19,300
Petroleum • Pétroles		
B.A. Oil	1,000	30,125
Hudson's Bay Oil & Gas	365	6,023
Pipelines		
Interprovincial Pipelines	585	47,093
Trans-Canada Pipe Lines	660	14,438
Electric Utilities • Electricité		
Calgary Power	1,390	28,495
International Utilities	900	44,100
Shawinigan Water & Power	805	19,924
Gas distribution • Distribution de gaz		
Consumers' Gas	2,500	48,438
Telephone • Téléphone		
Bell Telephone	800	40,700
Total		764,383
Foreign stocks • Actions ordinaires étrangères		
Chemicals • Produits chimiques		
E. I. du Pont	140	34,727
W. R. Grace & Co.	400	16,772
Monsanto Chemicals	770	40,456
Aviation		
North American Aviation	510	37,434
Electrical products • Produits électriques		
General Electric	220	17,677
Miscellaneous • Divers		
I.B.M.	60	25,703
Petroleum • Pétroles		
Gulf Oil Corp.	875	35,744
Total		208,513

L'Association Dentaire Canadienne

Volume 29

Numéro 1

janvier 1963

JOURNAL

The Canadian Dental Association

La méthode N_2 en endodontie

par Henryk Silbert, D.D.S., Montréal, P.Qué.

Ang. G. Sargenti, de Locarno, Suisse, et Samuel A. Richter, de St-Gall, Suisse, publient, en 1956, un volume intitulé *Traitement radiculaire par la méthode N_2* .¹ En 1959, leur livre est publié en langue anglaise sous un format beaucoup plus considérable; il est intitulé *Rationalized Root Canal Treatment*.²

Les auteurs y décrivent une nouvelle méthode de traitement des maladies pulpaire, qualifiée de "simplifiée" et de "rationnelle." Les distributeurs de médicaments dentaires, en même temps, entre-

prennent une vaste campagne de publicité tapageuse pour faire connaître un médicament qui doit révolutionner l'endodontie moderne; cette substance s'appelle N_2 médical et N_2 obturateur.

CONCEPTS ET TECHNIQUES DU TRAITEMENT

Résumons brièvement la philosophie et la technique de N_2 . En voici la formule, fournie par la compagnie AGSA (importateurs exclusifs pour le Canada et les Etats-Unis):

Conférence prononcée à la Société dentaire de Montréal, le 23 octobre 1962.

N₂ médical.—

Poudre: oxyde de zinc, 8.3% (action antiseptique); oxyde de titane, 75.9% (action adhésive); sulfate de baryum, 10% (action radiopaque); paraformaldéhyde, 14.7% (action momifiante et fixative de la pulpe); hydroxyde de calcium, 0.94% (action coagulante pour coiffer la pulpe); borate phénylmercurique, 0.16% (action antiseptique).

Liquide: eugénol, 92% (action antiseptique, anodine, cicatrisante de la plaie pulpaire, anesthésiante); huile de rose, 8% (action stimulante de la circulation et antiphlogistique prononcée).

N₂ obturateur.—

Poudre: oxyde de zinc, 72% (action antiseptique); sulfate de baryum, 12% (action radiopaque); oxyde de titane, 6.3% (action adhésive); paraformaldéhyde, 4.7% (action momifiante, durcissante et fixative de la pulpe vivante); hydroxyde de calcium, 0.94% (action coiffante de la pulpe vivante); borate phénylmercurique, 0.16% (action antiseptique).

Liquide: eugénol, 92% (action antiseptique, anodine, antiphlogistique et cicatrisante).

Les auteurs divisent les dents atteintes de maladie pulpaire en deux catégories:

(a) dents vivantes: avec région apicale normale, et

(b) dents mortes: avec pulpe gangréneuse avec ou sans raréfaction osseuse, c'est-à-dire avec région apicale nécrosée (voir schéma de traitement à la méthode N₂).

Traitement des dents vivantes

Obturation finale du canal.—"La méthode de l'obturation finale du canal est très simplifiée, car la façon compliquée d'obturer le canal avec des pointes de gutta-percha et des pointes d'argent exige beaucoup de temps de la part de l'opérateur; elle demande beaucoup de précision et beaucoup de dextérité; elle nécessite des mesures exactes de la dent par la radiographie.

Les auteurs la rejettent complètement parce qu'un dentiste ordinaire ne peut pas la réaliser."³

Quelle est donc la méthode simple d'obturer définitivement un canal, préconisée par Sargenti et Richter?

Cette technique consiste à obturer le canal avec la pâte obturatrice N₂ qui ne se résorbe pas; cette pâte s'introduit dans le canal avec la spirale rotative (bourse-pâte Lentulo), en faisant tourner le moteur à petite vitesse. Il n'est pas question de contrôle radiographique du résultat final de l'obturation.

La pâte N₂, selon le professeur Munch,² de Berlin, adhère parfaitement aux parois du canal et développe, avec le temps, une propriété de diffusion et de pénétration dans les canaux latéraux et dans les anfractuosités canalaires normalement inaccessibles.

Cette pâte, quand elle a durci, peut être partiellement enlevée au besoin, par exemple, pour introduire un corps coulé.

Il arrive parfois qu'il y a excès de la substance obturatrice N₂ et qu'elle dépasse l'apex, surtout quand le foramen apical est largement ouvert et quand l'instrument employé est le Lentulo. Une poussée inflammatoire apicale (périodontite) est alors à craindre: c'est une conséquence normale de cet accident. Mais, d'après les auteurs, cet excès de substance obturatrice se résorbe après trois jours et la dent devient alors asymptomatique.

Hémorragie pulpaire. — On sait que l'amputation d'une pulpe vivante s'accompagne d'hémorragie. Cette hémorragie, disent les auteurs, est minime, car ils préconisent l'emploi d'un alésoir (reamer) qui effectue cette opération sans déchirure du filet radiculaire.

Ils pratiquent l'amputation de la pulpe vivante à un niveau situé au tiers apical de la racine; ils évitent l'emploi du tire-nerf parce qu'il a tendance à lacérer le parenchyme pulpaire au cours de l'amputation d'une pulpe vivante. Ils procèdent immédiatement à l'obturation du canal avec la pâte obturatrice N₂ qui possède des qualités hémostatiques prononcées. Ainsi, on exécute en une seule séance l'extirpation de la pulpe, la préparation mécanique du canal (très discrète) et

Schéma de traitement à la méthode N₂.

Pathologie	Diagnostic	Traitement	Nombre de séances
A. Dents vivantes avec région apicale normale	Pulpites	(a) anesthésie locale	1 séance
	Causes: (a) carie profonde avec pulpe exposée (b) pulpe exposée durant la préparation de la cavité	(b) préparation mécani- que ($\frac{1}{2}$ apical) (c) obturation finale jusqu'au $\frac{1}{3}$ apical avec N ₂ obturateur avec Lentulo — tout est accompli pendant la même séance. La région apicale pul- paire reste vivante (amputation).	
B. Dents mortes Pulpes gangreneuses avec ou sans raréfac- tion osseuse avec région apicale nécro- tique.	(a) cas sans granulôme	1. désinfection cana- laire avec N ₂ médical	1 ou 2 séances
	(b) cas avec fistule	2. obturation finale ca- nalaire avec N ₂ ob- turateur	
	(c) cas avec obturation canaulaire précédente incomplète		
	(d) cas douteux de groupe A.		
	(a) cas avec granulôme	1er choix de traitement (a) anesthésie locale (b) désinfection cana- laire avec N ₂ médical (c) obturation canalaire avec N ₂ obturateur (d) fistule artificielle	1 séance
		2e choix de traitement (a) désinfection canalaire progressive par étape avec N ₂ médical pen- dant deux séances. (b) troisième séance: obturation finale cana- laire avec Lentulo avec N ₂ obturateur.	3 séances
	cas avec granulôme kystique	(a) anesthésie locale (b) désinfection cana- laire immédiate avec N ₂ médical (c) obturation immédiate avec N ₂ obturateur (d) apectomie et cure- tage périapical	1 séance

l'obturation finale avec la pâte obturatrice N_2 .

Traitement des dents mortes

Contrôle d'infection.—Les auteurs préconisent le N_2 médical comme le médicament antiseptique idéal pour stériliser un canal infecté; il suffit d'introduire cette pâte dans le canal à l'aide d'un Lentulo.

Ils prétendent que cette pâte peut stériliser adéquatement le canal infecté en une seule séance, c'est-à-dire, qu'à la séance suivante, on peut retirer le médicament du canal avec un alésoir et le remplacer immédiatement avec la pâte N_2 permanente.

Prétendus avantages.—Résumons brièvement les prétendus avantages de la pâte N_2 : (1) ne se résorbe pas dans le canal, ni dans les tissus périapicaux; (2) ne décolore pas les tissus dentaires, grâce à son insolubilité; (3) durcit, même en présence d'humidité; (4) est radiopaque à cause de la présence de sulfate de baryum; (5) a une action antiseptique durable, pénétrable et même permanente; (6) adhère aux parois du canal, elle se diffuse et pénètre en profondeur; (7) est bien tolérée par les tissus périapicaux (absence de douleur post-opératoire à cause de son effet antiphlogistique); et (8) on peut, si on le désire, combiner la technique classique d'obturation avec celle du N_2 ; mais cette combinaison des deux techniques n'est pas obligatoire. Le N_2 seul remplit le canal d'une façon hermétique et dense.

Contrôle radiologique et histologique.—On peut voir dans le volume^{1,2} des radiographies de contrôle prises quelques années après le traitement; ces films sont négatifs (absence de lésions périapicales) dans des cas d'amputation de pulpe vivante au 1/3 apical, au 1/3 moyen et même au tiers cervical.

Ces résultats remarquables sont dus, selon les auteurs, aux propriétés particulières du N_2 qui protège d'une façon permanente les résidus pulpaux non extirpés

contre les dangers d'infection. On y trouve aussi des radiographies qui illustrent la guérison de lésions périapicales (granulômes) traités par le N_2 .

Des coupes histologiques montrent la formation d'une zone sclérotique grâce à l'effet coiffant du N_2 dans la région où la pulpe a été amputée.

Traitement des dents temporaires avec le N_2 .—On peut traiter les dents temporaires atteintes de lésion pulpaire avec le N_2 . Les dents vivantes atteintes de pulpite aiguë ou chronique se traitent par l'amputation coronaire (pulpotomie) et par la déposition sur le plancher de la chambre pulpaire de la pâte obturatrice N_2 ; les filets radiculaires sont laissés in situ, coiffés et momifiés par le N_2 .

Les dents temporaires infectées sont traitées avec le N_2 médical qui stérilise le contenu nécrotique pulpaire. L'obturation permanente se fait à la séance suivante avec la pâte obturatrice N_2 . Cette méthode de traiter les dents primaires les maintient en place jusqu'à l'époque de leur élimination naturelle. On évite ainsi des poussées inflammatoires fréquentes et des malocclusions.

Conclusions des auteurs.—Les auteurs nous exposent une méthode simplifiée, rationnelle et même révolutionnaire pour traiter les maladies de la pulpe; elle diffère des techniques conventionnelles mises au point, surtout aux Etats-Unis, et prétendues trop rigides et trop compliquées pour le dentiste ordinaire.

Ils appuient la validité et la véracité de la méthode N_2 sur dix années de recherches en laboratoire et en clinique faites dans différents pays d'Europe.

Objections à la technique N_2

Les auteurs de cette nouvelle technique de traitement d'endodontie laissent de côté les principes classiques de la thérapie moderne des canaux, telle qu'enseignée et pratiquée aux Etats-Unis; ils aban-

donnent surtout les procédures qui exigent du dentiste la précision et la perfection de l'acte opératoire.

Ils prétendent que le dentiste n'est pas capable de pratiquer l'endodontie préconisée par l'école nord-américaine. Les auteurs, pour rendre le travail simple et rapide, éliminent ou simplifient plusieurs phases importantes du traitement.

1. *Préparation mécanique ou agrandissement du lumen du canal.*—La préparation mécanique du canal constitue la clé du succès du traitement canalaire; cette phase du traitement, à condition qu'elle soit bien exécutée, est d'une importance capitale pour la réussite des autres opérations qui doivent suivre.

La méthode N_2 attache peu d'importance à la préparation du canal; ses partisans conseillent d'amputer la pulpe vivante au 1/3 apical et d'obturer le canal au cours de la même séance; on touche à peine aux canaux subsidiaires; on coupe le tissu pulpaire à l'endroit où l'alésoir peut l'atteindre, sans se donner la peine d'élargir le canal jusqu'à l'apex. On abandonne la nécessité d'évaluer la longueur exacte de la dent par la radiographie. L'opération d'amputation de la pulpe — ou la pseudo-préparation mécanique du canal — se pratique à l'aveuglette, sans contrôle radiographique, sans précision.

2. *Irrigation biologique.* — La technique conventionnelle d'endodontie moderne comporte l'irrigation du canal, après qu'il ait été évidé et agrandi pour faciliter l'accès à l'apex. Après le lavage, on assèche le canal avec des pointes de papier absorbant.

La méthode N_2 néglige ces lavages à l'aide de solutions antiseptiques, douces, décapantes et hémostatiques pour éliminer tous les débris qui séjournent dans le canal. La pâte N_2 permanente est insérée dans le canal aussitôt après l'amputation de la pulpe. On prétend, il est vrai, que le N_2 est hémostatique et antiphlogistique; donc qu'il joue le rôle

d'un pansement idéal qui coiffe les résidus pulpaire non extirpés. On fait vite. Le N_2 durcit en présence d'humidité, donc nul besoin d'assécher le canal avant l'obturation définitive.

3. *Difficultés opératoires: cas difficiles.*—Tous les cas d'endodontie ne sont pas faciles; des difficultés anatomiques se présentent: canaux difficiles d'accès, calcifiés, corollaires, recourbés, étroits. Les procédés d'endodontie classique localisent, agrandissent, aseptisent et remplissent ces canaux tortueux.

Avec le N_2 , il n'y a pas de cas compliqués. Les canaux inaccessibles et anormaux des molaires ne présentent aucune difficulté aux adeptes de la méthode. Ils abdiquent en face d'un obstacle; ils ne se préoccupent pas des canaux compliqués; ils les coiffent, ils les momifient avec le N_2 obturateur. Ils traitent, avec le N_2 , sans discernement, tous les cas de maladie pulpaire. Il n'y a aucune sélection des cas. Le contrôle radiologique des phases du traitement et de l'obturation finale n'existe pas.

4. *Tests bactériologiques.* — Les épreuves bactériologiques du contenu du canal constituent les seuls moyens de s'assurer de sa stérilité, avant son obturation finale.

Le volume 2 ne dit mot de cette simple mesure de précaution qui détermine l'existence ou l'absence d'infection dans le canal. Les auteurs préconisent d'obturer définitivement le canal, sans s'assurer de sa stérilité. L'aseptie du champ opératoire, des instruments et de la dent paraissent choses inconnues. Toute intervention dans le canal est exécutée sans digue avec appareillage non stérile. Les auteurs disent de ne pas craindre l'infiltration de la salive dans le canal, car le N_2 détruit les quelques bactéries qui peuvent s'y trouver. Ils ne peuvent donc pas, en toute logique, conseiller des prises de culture s'ils ne respectent pas les principes élémentaires d'aseptie.

5. *Instrumentation.* — L'endodontiste doit avoir des instruments qui s'adaptent à

tous les cas.

L'instrumentation recommandée pour la méthode N_2 est primitive et insuffisante: elle ne permet pas d'exécuter des opérations avec précision. Elle se chiffre à quelques instruments de base, tels que fraises rondes ou à fissure pour la trépanation de la chambre pulpaire; quelques alésoirs non gradués pour amputer la pulpe et élargir le canal. Les auteurs se servent d'un alésoir rotatif pour agrandir rapidement le canal; cette technique est dangereuse, car elle invite la fracture des instruments et la création de faux canaux au sein des canaux étroits.

6. *Stérilisation du canal.* — L'endodontie moderne ne possède pas l'antiseptique spécifique, idéal, pour détruire toutes les bactéries renfermées dans la pulpe d'une dent infectée: deux ou trois séances sont nécessaires pour obtenir, à l'aide des antiseptiques ou des antibiotiques connus, l'aseptie d'un canal radiculaire, vérifiée par des cultures négatives.

La méthode préconisée par Sargenti et Ritcher confie au N_2 médical, seul, la tâche de stériliser l'intérieur d'un canal radiculaire infecté; ceux-ci conseillent, au cours d'une seule séance, d'introduire la pâte N_2 dans le canal et de laisser agir le médicament. Cette affirmation est inacceptable.

7. *Obturation finale du canal.* — Une obturation compacte du canal est essentielle au succès de l'intervention. L'endodontiste nord-américain s'efforce toujours d'introduire dans le canal, en se servant de fouloirs appropriés, le plus grand nombre possible de tiges de gutta-percha enduites de ciment pour fermer hermétiquement tous les canaux accessoires et prévenir l'infiltration de suintements physiologiques.

De même, les tiges de métal utilisées dans le scellement de canaux sont choisies d'une jauge identique à celle des canaux pour assurer l'étanchéité du canal.

La méthode N_2 conseille d'obturer le canal à l'aide d'une pâte introduite dans

le canal avec le bourre-pâte Lentulo rotatif; cette procédure doit assurer une excellente obturation canalaire jusqu'à l'apex. Le Lentulo, de l'expérience de plusieurs opérateurs, ne peut obturer le canal hermétiquement, car il chasse la pâte sans aucun contrôle; il donne une obturation trop lâche ou un excès qui fuse à l'apex; ce surplus, à cause de la non-résorbabilité de la substance obturatrice, occasionne une irritation des tissus péri-apicaux.

Le Lentulo, de plus, est très fragile et il brise fréquemment quand il est utilisé dans des canaux étroits. Cet instrument peut servir seulement pour introduire certaines pâtes médicamenteuses dans des canaux larges.

OPINION DU CONSEIL DES THÉRAPEUTIQUES DENTAIRES DE L'A.D.A.

Le mandat du Conseil des thérapeutiques dentaires est de veiller sur la valeur des préparations médicamenteuses offertes à la profession dentaire des Etats-Unis.

Aussi s'intéressa-t-il au N_2 dès que ce médicament, sans l'approbation d'aucun organisme officiel, fit son apparition sur le marché américain.

Le Conseil en fit l'analyse chimique quantitative et qualitative et pria le service d'endodontie de l'université de Toronto d'effectuer des essais cliniques.

Le Conseil publia ensuite un rapport,³ dont voici certains extraits.

On répand sur notre marché un produit qui possède le pouvoir de stériliser le contenu canalaire en une seule séance. On conseille aussi d'obturer le canal d'une façon non hermétique. Ce produit est distribué par des importateurs sans approbation préalable, ce qui est contraire au code d'éthique de l'A.D.A.

Le Conseil des thérapeutiques dentaires, dans le but de vérifier les qualités supposées extraordinaires réclamées par les auteurs du N_2 , s'adressa à la section de bactériologie du service d'endodontie de l'Université de Toronto pour contrôler et

évaluer les propriétés du produit. Le rapport des bactériologistes consultés, qui ont soumis le N_2 à quatre tests bactériologiques différents, a révélé que le N_2 n'a pas de qualités antiseptiques exceptionnelles. On a fait des recherches en comparant le pouvoir bactéricide de quatre agents antiseptiques: (1) P.M.C.P.C.; (2) eugénol; (3) N_2 médical; (4) N_2 obturateur.

Les résultats de ces examens ont établi clairement que les quatre agents qui furent vérifiés possèdent une valeur comparable dans leur pouvoir d'inhiber la croissance bactérienne.

Le N_2 ne possède donc pas ces propriétés extraordinaires permanentes de diffusion antiseptique.

Des maîtres de l'endodontie, tels que Orlander, Sommer, Ingle, Grossman, Torneck et Stewart sont d'accord sur la nécessité de consacrer trois ou quatre séances de stérilisation avant d'obtenir une culture négative dans un canal infecté.

Les préparations qui contiennent de la paraformaldéhyde sont irritantes pour les tissus. Or le N_2 contient de la paraformaldéhyde.

Les bactériologistes de l'Université de Toronto⁴ ont aussi vérifié, en insérant ces substances dans des muscles de rats, la compatibilité du N_2 médical et du N_2 obturateur avec les tissus vivants. Ils ont constaté par des examens microscopiques des inflammations considérables du tissu environnant les implants.

Le conseil des thérapeutiques dentaires, dans son rapport,³ exprime aussi son opinion sur l'inacceptabilité des méthodes de traitement canalaire qui préconisent des obturations finales canalaire au 1/3 apical, au 1/3 moyen et au 1/3 cervical, selon l'accessibilité du canal dans les cas des amputations vivantes. L'expérience clinique démontre clairement que l'obturation canalaire incomplète est vouée à l'échec dans la majorité des cas, à cause de la pénétration des fluides périapicaux dans l'espace vide du canal où ils s'y décomposent, où ils y stagnent, pour ensuite se répandre dans l'espace périapical.

Ingle, spécialiste renommé d'endodontie, attribue 75% des échecs de la thérapie canalaire à l'obturation incomplète.

En conclusion, le Conseil des thérapeutiques dentaires a déclaré le N_2 médical et le N_2 obturateur inacceptables en les classant parmi le groupe D des médicaments qui ne répondent pas à ses standards et à ses exigences. Par ce fait, le Conseil a ordonné de suspendre la distribution du produit aux Etats-Unis.

CONCLUSION

La recherche moderne en endodontie nous démontre clairement que certaines préparations canalaire médicamenteuses, telles que phénol, le paraformaldéhyde, la créosote et le trioxyméthylène produisant des irritations des tissus périapicaux, nuisent et retardent le processus de la réparation des tissus après le traitement du canal. Les préparations canalaire médicamenteuses, telles que les antiseptiques doux, par exemple, le P.M.C.P.C. et la crésatine, les antibiotiques, tels que P.B.S.C. et Néo-Cortef et les acides basiques, tels que le E.D.T.A.C. de Ostby, produisent très peu d'irritation. Il est donc souhaitable de donner la préférence en thérapie canalaire aux médicaments qui sont compatibles avec les tissus vivants, qui respectent leur intégrité et qui sont en même temps efficaces.

Comment peut-on admettre une nouvelle technique d'endodontie qui préconise de fermer définitivement le canal après une seule séance de stérilisation à l'aide d'un antiseptique ordinaire?

SUMMARY

The author discusses the value of a formaldehyde preparation, N_2 , as an antiseptic and filling material in endodontic practice. Expressing a personal opinion, he condemns the N_2 technique for the following reasons: (1) failure to evaluate radiographically the length of the root canal; (2) failure to widen the root canal; (3) failure to irrigate the canal; (4) steri-

lization of the canal is limited to one sitting; (5) omission of bacteriological culture control; (6) inadequate instrumentation; (7) illusory success with difficult cases; (8) disregard for the fundamental principles of asepsis; (9) employment of a filling material of inadequate density; and (10) employment of a filling material which is an irritant to the tissues. All these factors are judged important in modern North American endodontic practice.

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Le métabolisme des sels organiques dans l'os et particulièrement du citrate

par Jean-Paul Lussier,* D.D.S., Ph.D., Montréal, P. Qué.

L'étude des transformations qui s'opèrent sous diverses conditions normales ou pathologiques, au niveau du tissu osseux et d'une façon générale au niveau de tout tissu calcifié, a été menée depuis le début du siècle en fonction du contenu des matières inorganiques de l'os, plus spécialement du calcium et du phosphore. De fait, ces deux éléments représentent près de la moitié du poids du tissu osseux et des autres concrétions. On a questionné en détail les moindres variations de ces composants afin de savoir si elles reflétaient fidèlement la nature et la gravité des situations pathologiques présentes et si elles témoignaient de l'efficacité des traitements employés pour corriger une situation anormale.

Les constituants organiques, comme les muco-polysaccharides de la substance fondamentale, le collagène des fibres et

les autres protéines dont la nature est soupçonnée mais encore imparfaitement déterminée, sont l'objet de variations qui font état du stage de développement du tissu. Ce peut être le degré de polymérisation de la substance fondamentale qui est en évidence ou encore le nombre ou les propriétés des fibres qui sont dans le tissu osseux. Dans tous les cas, les variations de structure entraînent des manifestations plus ou moins graves au niveau des qualités de l'os et son métabolisme. Ces questions ne manquent sûrement pas d'intérêt et elles reçoivent l'attaque des méthodes les plus perfectionnées que la chimie et la physique mettent à la disposition des chercheurs. De tous les constituants osseux dont on tente d'élucider le rôle, dont on scrute la signification, les sels organiques nous semblent parmi les plus riches de promesses. Le plus connu des sels organiques de l'os est sans aucun doute le citrate qui, en raison de ces propriétés spéciales, revêt une importance

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primordiale dans l'étude du métabolisme osseux. La reconnaissance du citrate dans l'os s'est fait depuis une vingtaine d'années. Depuis ce temps également, on a appris que le citrate est le siège de variations notables au niveau de ce tissu, mais ce n'est que depuis une dizaine d'années que l'on s'intéresse sérieusement à ce témoin fidèle du métabolisme osseux.

PROPRIÉTÉS PHYSIOLOGIQUES DU CITRATE

Voici quelques faits qui mettent en évidence les caractères physiologiques du citrate.

1. Toute cellule qui métabolise le glucose est susceptible de produire du citrate. Il est donc normal de postuler que les cellules du tissu osseux peuvent aussi produire du citrate, au moins dans les conditions normales.

2. Le citrate peut se complexer avec des cations comme le calcium et former des sels calciques, solubles même à un pH neutre ou faiblement alcalin; alors que des sels, comme le phosphate et le carbonate de calcium, ont tendance à se précipiter au pH du plasma ou du liquide extra cellulaire, le citrate de calcium reste en solution.

3. Les cellules non seulement synthétisent rapidement le citrate, mais elles peuvent le métaboliser tout aussi facilement. C'est le cas, entre autres, des cellules du rein qui le métabolisent rapidement et en grande quantité. Il semble que la récupération du calcium au niveau du rein se fasse par ce moyen ou du moins ce mécanisme serait l'un dont se sert le rein pour économiser le calcium.

4. Le citrate, comme beaucoup d'autres composés, est absorbé au niveau des cristaux d'apatite. Il a été prouvé que le citrate peut se substituer à tout anion

qui se trouve à la surface des cristaux d'apatite. Cependant, en raison des vastes dimensions de sa molécule, le citrate ne peut pas être incorporé dans le cristal d'apatite lui-même. Cette considération permet de souligner l'importance des phénomènes de surface dans la physiologie osseuse.

TENEUR EN CITRATE DANS LES OS ET AUTRES TISSUS DES MAMMIFÈRES

La détermination de citrate faite au niveau des tissus mous et de l'os démontre que ce tissu est extrêmement riche en ce composé, comparativement à ceux qui sont en liste (Tableau 1). Cette différence vient de ce que dans les tissus mous le citrate ne peut s'accumuler; ou il est métabolisé assez rapidement, ou il diffuse dans le liquide extra-cellulaire; alors que dans le tissu calcifié, l'élément cellulaire étant relativement pauvre et l'élément cristallisé relativement riche, le citrate est lentement métabolisé et surtout absorbé au niveau des cristaux qui le retiennent par des forces électro-chimiques.

Cette capacité des os, à renfermer beaucoup de citrate, se retrouve dans les mammifères et aussi dans les os des oiseaux (Tableau 2). Elle devient moins évidente, quand il s'agit des animaux qui ont des exosquelettes et dont la composition cristalline est pauvre en apatite.

TABLEAU 1 Contenu des tissus en acide citrique.*

	$\mu\text{g/ml}$
Sang total	15
Plasma	25
Gl. rouges	10
Lait	500-1250
Urine	100-750
Sement	2000-4000
LCR	50
Rein	20 p.p.m.
Foie	5 p.p.m.
Os	7500 p.p.m.

*D'après Thurnberg.¹

TABLEAU 2 Acides organiques de l'os.*

Acide	Mg. % Cm. d'os sec	Mg. % Cm. de foie
Acide citrique	750	3.3
Malique	5.5	1.
Aconitique	3.0	0.1
Succinique	2.5	2.5
Fumarique	0.2	0.5
Lactique	traces	—
Pyruvique	traces	—
α -cétoglutarique	traces	—

*D'après Lees et Kuyper.²

ORIGINE DU CITRATE OSSEUX

Deux sources peuvent assumer la responsabilité d'introduire de vastes quantités de citrate dans l'os. La première est exogène par rapport à l'os: c'est le citrate apporté dans le sang circulant par l'alimentation dans son sens le plus large, (qu'il s'agisse du citrate présent dans le plasma maternel, aussi bien que celui qui fait partie des aliments ingérés et qui est assimilé au niveau de l'intestin). Le citrate sanguin à la concentration de 0.6 à 1.5 mgm peut constamment être échangé pour d'autres constituants osseux, comme on vient de le mentionner.

La seconde est endogène. Les cellules de l'os lui-même, en synthétisant le citrate au cours de leur propre métabolisme, créeraient sur place des conditions telles qu'il resterait affixé à la structure cristalline plutôt que d'être entraîné par les courants de fluides intercellulaires. Laquelle de ces deux sources est la plus importante en quantité aussi bien qu'en qualité, reste encore à déterminer.

RÔLE DYNAMIQUE DU CITRATE

Nous venons de souligner que le citrate peut assez facilement apparaître à la suite de l'activité cellulaire tout comme il peut être soustrait au milieu en suivant la chaîne des réactions du cycle de Krebs. Actuellement, on tente de répondre à la question à savoir: si dans l'os, il y a possibilité que le citrate, sous l'influence de divers facteurs, s'accumule momentanément dans les régions où l'os est en voie de formation ou de résorption. Le calcul des concentrations et des solubilités nous permet d'établir que le calcium est véhiculé en partie au moyen du citrate et se maintient par lui en état de sursaturation dans le plasma et le LEC. Une telle solution imbibant la matrice entraîne une accumulation de calcium, si le citrate est rapidement métabolisé. En raison de la présence d'une quantité suffisante de phosphate, la cristallisation peut maintenant s'initier. Dans les conditions d'ostéolyse, une surproduction de citrate entraînerait une déminéralisation super-

TABLEAU 3 Teneur des os en acide citrique en % de matière sèche.*

Selon l'espèce ³		Selon l'os (homme) ¹	
Porc	0.60	Fémur	1.62
Bœuf	0.45	Clavicule	1.88
Rat	0.84	Côte	1.75
Souris	0.70	Vertèbre	0.89
Grenouille	0.30		
Goéland	2.06 (omoplate)		

*D'après Taufel et Krusen.³

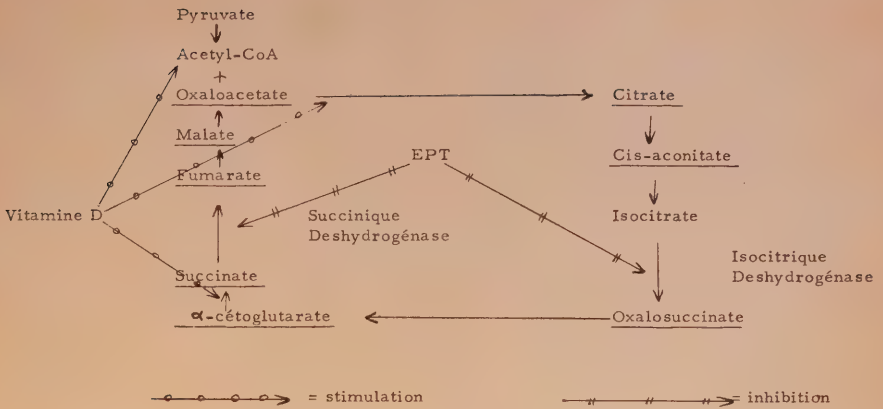


TABLEAU 4 Cycle de Krebs dans l'os.

ficielle de l'os mettant à jour la matrice qui serait ensuite phagocytée par les ostéoclastes.

Cette hypothèse suscite beaucoup d'intérêt et stimule les chercheurs à apporter des nouveaux faits qui en confirmeraient la validité. Voici certains faits de date récente et que nous rapporterons pour justifier l'exactitude de l'hypothèse. Dans leur excellente monographie, Neuman et Neuman⁴ soutiennent que la sursaturation du milieu extra-cellulaire osseux en calcium, peut s'expliquer par trois mécanismes:

1. La présence à haute concentration d'un ion solubilisant qui agirait localement par échange en surface;
2. La production locale d'un chelateur de calcium qui soustrait le calcium ionisé du milieu;
3. La production localisée d'un composé acide qui pourrait appréciablement diminuer le pH dans une région circonscrite.

Dans les trois cas, seul le citrate est appelé à jouer un rôle important, car les composés analogues ne semblent pas

intervenir en quantité suffisante. Neuman a tenté une expérience qui supporte l'hypothèse ci-haut énoncée. On injecte à un chien une aliquote d'une solution de radio-strontium. Un peu plus tard, on introduit une dose d'extrait parathyroïdien, on mesure ensuite le radio-strontium et l'acide citrique dans le sang. On fait de même avec le sang qui provient de la veine fémorale. Le radio-strontium reste toujours plus élevé dans le sang artériel que dans le sang veineux, alors que l'acide citrique, lui, est plus élevé dans le sang veineux. Sous l'influence de la parathormone, les quantités absolues augmentent dans le sang artériel et dans le sang veineux, mais la différence artérioveineuse reste constante. Ceci apporte la preuve que le tissu osseux est une source de citrate pour le reste de l'organisme et aussi que la parathyroïde stimule la production du citrate dans l'os.

BIOSYNTHESE DU CITRATE OSSEUX

L'étude des enzymes responsables de la production du citrate au niveau de l'os laisse entrevoir qu'il existe dans ce tissu

des particularités assez importantes et assez précises pour expliquer comment l'os peut devenir producteur d'acide citrique. Parmi les enzymes qui ont été étudiées, on a pu mettre en évidence que la déshydrogénase iso-citrique, responsable de l'utilisation du citrate, est relativement pauvre au niveau de l'os. Par contre la citrogénase, enzyme qui régularise l'accouplement d'acetyl-coenzyme A et d'oxalo-acetate, s'y trouve en grande quantité.

D'autres auteurs⁵ ont démontré que la déshydrogénase succinique, qui, par transformation du succinate en fumarate, accélère l'utilisation du citrate, devient inhibée en présence d'un excès d'extrait parathyroïdien.

Il n'y a pas que la parathormone pour agir sur les différents systèmes enzymatiques de l'os. Il semble que la vitamine D joue aussi un rôle très important dans la production du citrate. Il existe plusieurs indications que cette vitamine intervient dans la synthèse du coenzyme A, de la cocarboxylase ou même de l'acide lipoyique. Dans ce secteur, les travaux ne sont pas encore assez coordonnés pour nous permettre des affirmations directes; il faudra s'attacher à cette question quelque temps encore avant d'en arriver à des explications définitives. Le tableau 4 résume certaines des données acquises.

ETUDE COMPARATIVE DU CITRATE ENTRE L'OS ET LES TISSUS MOUS

Nous avons tenté d'établir une comparaison entre les taux d'utilisation et de synthèse du citrate dans l'os et d'autres tissus spécialisés de l'organisme, comme le rein et le foie, sous l'influence de facteurs de stimulation ou d'inhibition comme la vitamine D ou certaines hormones. Nous avons pu, en utilisant de l'acide citrique marqué avec du carbone radio-actif confirmer que l'influence de la parathormone

est spécifique à l'os. Nous avons aussi déterminé que l'animal sans rein peut métaboliser des doses physiologiques de citrate à condition que le foie soit intact. Cette observation remet en question l'importance du foie par rapport au citrate et des systèmes enzymatiques particuliers dont il est pourvu. Même si apparemment ces observations nous entraînent loin du métabolisme de l'os, elles nous aident à mieux comprendre les différences qui caractérisent les systèmes enzymatiques qui produisent ou utilisent le citrate dans les divers tissus de l'organisme et à préciser les conditions qui régissent leurs activités et qui semblent plus spécifiques que l'on aurait pu l'imaginer.

L'étude de la physiologie des sels organiques de l'os, entre autres le citrate, nous promet des renseignements primordiaux sur la vie cellulaire au niveau des tissus calcifiés.

SUMMARY

Organic salts, particularly citrate, are considered to be among the most informative materials in the metabolism of calcified tissues. Their physico-chemical properties and their behaviour when bound to calcium permit a clearer understanding of calcium turnover, bone resorption and more generally of all the dynamics which take place in bone tissue.

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2900 blvd du Mt-Royal

La section française du Journal de l'Association dentaire canadienne

La première livraison du vingt-neuvième volume du *Journal de l'Association dentaire canadienne* se présente aux lecteurs sous d'heureux auspices. L'Association dentaire canadienne, par le truchement de son comité du journalisme, a ajouté, au cours de son assemblée de juin dernier tenue à Vancouver, du sang nouveau à la rédaction de la partie française: elle a nommé trois assistants-rédacteurs, qui représentent les trois régions les plus peuplées de la province de Québec, Québec, Trois-Rivières, Sherbrooke.

Le mandat de ces assistants-rédacteurs consiste à fournir au Journal des nouvelles professionnelles de leur région et à se procurer les textes de conférences présentées aux sociétés dentaires locales et susceptibles d'être publiées.

L'équipe de rédaction s'est réunie, pour la première fois, l'automne dernier, en compagnie du rédacteur de la section anglaise, et elle a jeté les bases d'une collaboration qui est de bon augure pour les lecteurs d'expression française.

Des projets se sont amorcés: par exemple, l'intégration de la section française dans la section anglaise de façon à éliminer la division actuelle en deux parties distinctes; le Journal serait ainsi plus homogène et les lecteurs portés à lire les articles écrits en anglais et ceux écrits en français. Plusieurs revues cana-

diennes et européennes agissent de cette façon.

Un début d'intégration a été déjà réalisé par la publication de résumés de langue différente de celle dans laquelle sont écrits les articles; d'autres initiatives du même genre suivront, car les rapports émanant du Bureau des recherches économiques de l'A.D.C. seront rédigés en même temps dans les deux langues.

Des éditoriaux seront aussi publiés tous les mois pour discuter de questions professionnelles, économiques, sociales et législatives qui se posent au Canada français dans le secteur de la profession dentaire. Ces idées seront exposées tantôt par le rédacteur, tantôt par un des assistants-rédacteurs.

En un mot, la partie française du Journal veut être l'expression complète de la littérature dentaire de langue française du Canada.

Ces réformes arrivent en temps opportun. Notre groupement professionnel prend de l'ampleur et de la qualité; les pays étrangers (surtout l'Europe) prennent conscience de notre existence; notre faculté prend de la valeur et y attire des dentistes francophones des pays de langue française d'Europe, d'Afrique et du Moyen-Orient.

La jeune génération a un message à porter: message scientifique et social. Elle a appris à s'exprimer à l'Université et il

lui faut un organe pour exposer ses idées.

La production scientifique de la profession s'amplifie: des chercheurs sont à l'œuvre; les communications présentées aux sociétés dentaires locales et au congrès provincial sont plus nombreuses et

de meilleure qualité. La section française du Journal se place en parallèle avec ce renouveau et désire satisfaire une "clientèle" normalement plus exigeante et plus avide de connaissances de toutes sortes.

G. de M.

les actualités dentaires

L'Association

LANCEMENT AU CANADA DU FONDS POUR L'ENSEIGNEMENT DENTAIRE

Le Fonds canadien pour l'enseignement dentaire n'attend que l'approbation officielle de sa charte pour entrer en existence. Le Conseil des Gouverneurs de l'Association dentaire canadienne, à son assemblée de juin dernier, a sanctionné en principe l'établissement de ce fonds.

Le président du Fonds est le docteur James D. McLean, doyen de la faculté de chirurgie dentaire de l'Université Dalhousie, à Halifax. Les fiduciaires au Fonds, selon leur distribution géographique au Canada, sont les docteurs Louis Lépine, de Montréal, Harvey W. Reid, de Toronto, et Wesley P. Munsie, de Vancouver. M. E-M. (Bud) Bower, président de la Dental Company of Canada, représente au Conseil de fiducie l'industrie des produits dentaires. Le Conseil Exécutif de l'Association dentaire canadienne a fait ces nominations, en octobre dernier. Les fiduciaires se sont réunis pour la première fois à Toronto, le 30 novembre, et un de leurs projets les plus importants est d'élaborer des façons d'amasser des fonds. Les firmes commerciales ont déjà promis \$10,000. L'Association dentaire canadienne s'est engagée à souscrire \$5,000 et à défrayer les dépenses d'incorporation et des assemblées. Le Fonds sera administré par l'Association dentaire canadienne sous forme de fiducie. Les fiduciaires doivent établir les

politiques pour amasser l'argent et le distribuer

Le Conseil des Gouverneurs a approuvé les objectifs du Fonds canadien pour l'enseignement dentaire qui sont de "percevoir des argents ou des valeurs négociables de toutes sortes dans le but d'aider ou d'améliorer directement ou indirectement l'enseignement dentaire, grâce à des projets destinés à améliorer la santé dentaire par l'enseignement et la recherche, en collaboration avec les facultés dentaires et leurs étudiants". Les fiduciaires ont la tâche d'élaborer des règlements au sujet des subventions.

TOURNÉE DU PRÉSIDENT DANS L'EST DU PAYS

Le docteur M. V. J. Keenan, président, et le docteur Don W. Gullett, secrétaire de l'Association dentaire canadienne, ont fait une tournée dans l'est du pays au cours du mois de novembre. Ils ont adressé la parole devant les sociétés dentaires des villes suivantes:

St-Jean, N.-B., le 12 novembre
Charlottetown, I.-P.-E., le 13 novembre
Halifax, N.-E., le 14 novembre
Québec, P. Qué., le 15 novembre
Montréal, P. Qué., le 19 novembre

Le président et le secrétaire se sont rendus à Terre-Neuve, au début d'octobre, à l'occasion du congrès annuel de la Société dentaire de Terre-Neuve.

ASSEMBLÉES DE COMITÉS DE L'A.D.C.

La cédule chargée des assemblées de conseils et de comités de l'Association dentaire canadienne montre que l'année sera bien remplie. A date, les réunions qui ont eu lieu sont les suivantes: comité des services dentaires les 5 et 6 novembre; conférence des secrétaires, les 3 et 5 décembre.

Celles qui se sont annoncées sont les suivantes: comité des services auxiliaires, les 21 et 22 janvier; conseil exécutif, les 11, 12 et 13 février; conseil d'hygiène dentaire publique, les 20 et 21 février; conférence sur l'enseignement de l'orthodontie, les 19 et 20 mars; conseil d'enseignement, les 21 et 22 mars.

D'autres assemblées s'annoncent; d'autres ont lieu en dehors du secrétariat de l'Association et des groupes se réunissent plus fréquemment au cours des soirées. Les rapports de ces activités seront présentés à la réunion annuelle du Conseil des Gouverneurs, qui auront lieu à Toronto du 15 au 18 mai 1963.

HONNEUR À UN CINQUANTENAIRE

Le 29 septembre dernier, avait lieu, à Sherbrooke, Qué., une fête intime organisée pour rendre hommage au docteur Oliva Cyr, de Thetford Mines, à l'occasion de ses 50 ans de pratique active. Le banquet, présidé par le docteur René Poisson, président de la Société Dentaire des Cantons de l'Est, réunissait près de cent convives, parents, amis et confrères du héros. Le docteur Valmore Olivier, qui compte 51 ans de pratique, se fit l'interprète de l'assemblée et félicita le docteur Cyr pour sa constante jeunesse.

ELECTIONS AU COLLÈGE DES CHIRURGIENS DENTISTES



Le docteur
Henri Brouillet

Les Sociétés dentaires

NOUVEAU DOYEN FÊTÉ

La Société Dentaire des Cantons de l'Est a pris, récemment, l'initiative d'organiser une réunion de confrères pour souhaiter la bienvenue et rendre hommage au nouveau doyen de la faculté dentaire de l'Université de Montréal, le docteur Jean-Paul Lussier. Une quarantaine de dentistes se sont rendus à Granby pour un banquet présidé par le docteur Jacques Jolin, où le docteur Conrad Godin, de Trois-Rivières, servit une conférence sur le travail gigantesque qui se fait dans toutes nos associations locales, régionales, provinciales et nationale. Outre ceux déjà mentionnés, on reconnaissait à la table d'honneur les docteurs Robert LeBlanc, Lorenzo Picard, Gérard de Montigny, Charles-E. Simard et René Poisson.

Le Bureau des Gouverneurs du Collège des chirurgiens dentistes de la province de Québec, en conformité avec les règlements du Collège, a élu un nouveau comité exécutif qui dirigera ses destinées durant les deux prochaines années.

Le nouvel exécutif se compose comme suit: président: Henri Brouillet, Montréal; 1er vice-président: Bruce D. Ward, Montréal; 2ième vice-président: Lorenzo Picard, Sorel; secrétaire-registraire: Robert LeBlanc, Montréal; conseillers: Archambault, Marcel (Montréal), Bernier, Louis (Québec), Charette, Roger (Montréal), Dubé, Victorien (Montréal), Fontaine, Jean (Montréal), Giroux, Julien (Sherbrooke), Oliver, Howard T. (Montréal), Zimmerman, George (Montréal); aviseur: Langlois, Rémy (Québec).

Le Canada

ONTARIO

Etablissez la fluoruration maintenant; votez plus tard! — Les citoyens de Windsor, à la suite de divergences d'opinions, ont voté sur la fluoruration au cours de leurs élections municipales, en décembre dernier. Le conseil de ville s'était prononcé en faveur de cette mesure et on avait commencé à fluorurer l'eau à la fin de septembre.

Un comité "pour une eau sûre" avait tenté à plusieurs reprises d'arrêter la fluoruration, même en s'adressant aux cours de justice. Il devait y avoir un procès au début d'octobre, mais le comité avait retiré sa poursuite croyant que la cour ne pourrait peut-être pas rendre son jugement avant le référendum du 3 décembre. Selon des rapports, il n'y a pas eu de plainte au sujet du goût ou de l'odeur de l'eau.

SASKATCHEWAN

Le rapport de la Saskatchewan appuie les dentistes. — Le comité Thompson de la Saskatchewan sur les services médicaux appuie les dentistes qui prétendent que la province devrait diriger son programme de santé dentaire publique chez les enfants. Le rapport du comité, qui a été publié en septembre, soutient aussi l'opinion des dentistes qui recommandent que tous les aqueducs municipaux utilisent la fluoruration. Le rapport demande aussi que "les autorités compétentes songent sérieusement, à cette heure, à fonder une faculté dentaire à l'Université de Saskatchewan".

Le comité Thompson (comité consultatif pour l'organisation des services médicaux) fut nommé en avril 1960 pour éclairer le gouvernement sur les meilleures méthodes susceptibles d'améliorer les services de santé mis à la disposition de la population de la province. Le comité, en septembre 1961, à la demande du gouvernement, a soumis un rapport intérimaire consacré surtout à un plan d'assurance-santé médicale.

On peut ainsi résumer les recommandations du comité au sujet de la santé dentaire:

— donner plus d'importance aux mesures préventives, par exemple, amplifier et améliorer les programmes régionaux d'éducation en hygiène dentaire à l'intention des enfants d'âge scolaire et d'âge pré-scolaire et mettre en acte la fluoruration de l'eau des aqueducs;

— établir, à la suite de campagnes intensives d'éducation en hygiène dentaire, un système financé à l'aide de taxes pour traiter les enfants par groupes d'âge qui iraient en augmentant à mesure que les effectifs dentaires pourront s'occuper des nécessités connues;

— aider davantage des étudiants dentaires en les faisant bénéficier de bourses d'études et en offrant des subventions aux dentistes qui consentiraient à exercer dans les centres ruraux;

— songer sérieusement à fonder une faculté dentaire;

— créer un nouveau genre d'auxiliaires dentaires pour augmenter le volume des services.

Le rapport du comité fait des allusions favorables au mémoire que lui avait soumis le Collège des chirurgiens dentistes de Saskatchewan et au mémoire que l'Association dentaire canadienne avait présenté à la Commission royale d'enquête sur les services de santé.

Chronique internationale

ÉTATS-UNIS

La ville de Kansas fluorure son eau au bénéfice de 650,000 habitants. — Plus de 650,000 habitants de plus de l'Etat du Missouri consomment de l'eau fluorée, depuis que la ville de Kansas a adopté la fluoruration. Sept autres municipalités, en plus des 33 du Missouri qui utilisent cette mesure, ont voté en faveur de la fluoruration et sont à installer l'appareillage nécessaire. 48 autres villes ont une eau qui contient naturellement du fluor au taux désirable. Ce qui veut dire que, quand 88 villes fluoreront leur eau, 57 pour cent de la population bénéficiera de cette mesure.



seule **Bioblend**[®] offre
une gamme de dents
aux couleurs naturelles
correspondant à l'âge
et au teint individuels

dans chaque cas de prothèse

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*The Dentists' Supply Company of New York,
York, Pennsylvania*

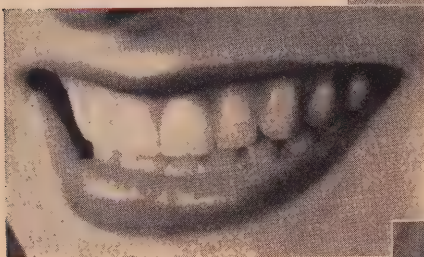
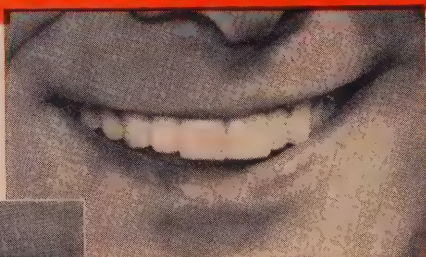


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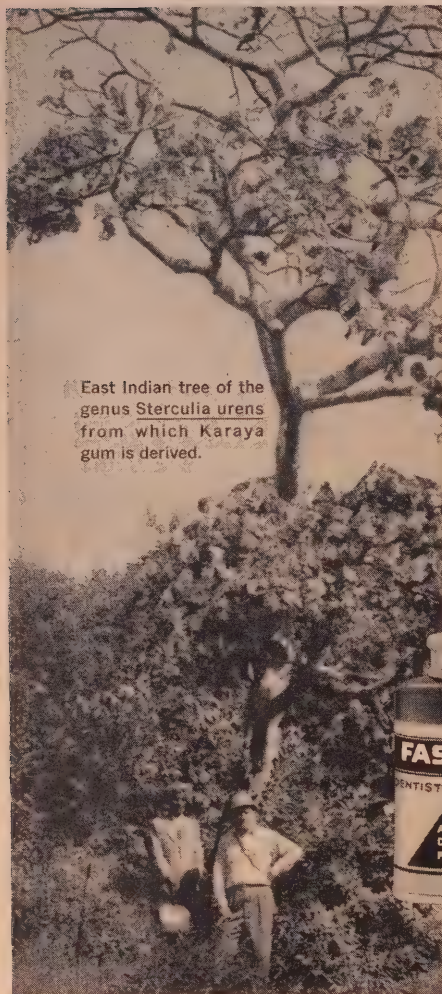
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Reinforced crown and bridge construction provides the necessary strength so that porcelain, always the material of choice, can be utilized to achieve a most natural appearance.

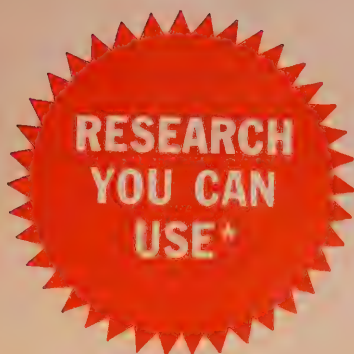
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★A Comparative Assessment of Three Medicaments for the Treatment of Acute Ulcerative Gingivitis of the Vincent's Type. A. Bryan Wade, B.Ch.D., F.D.S., G. C. Blake, M.B., B.S., F.D.S., J. D. Manson, B.Ch.D., F.D.S., Elsebeth G. B. Andersen (Tandlaege, Royal Dental College, Copenhagen), Margaret E. Arnold, B.C.S., L.D.S., Royal Dental Hospital of London School of Dental Surgery and the Institute of Dental Surgery University of London. British Dental Journal, Volume 111, Number 8, October 17, 1961.

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Local
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That...



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* Local Anesthetics: Results of cooperative research survey III. N.Y. State Dental Journal, Vol. 24, No. 5. (Copies of report on request).

For special operative procedures where longer anesthesia — 2-2½ hrs. — is needed, we suggest.

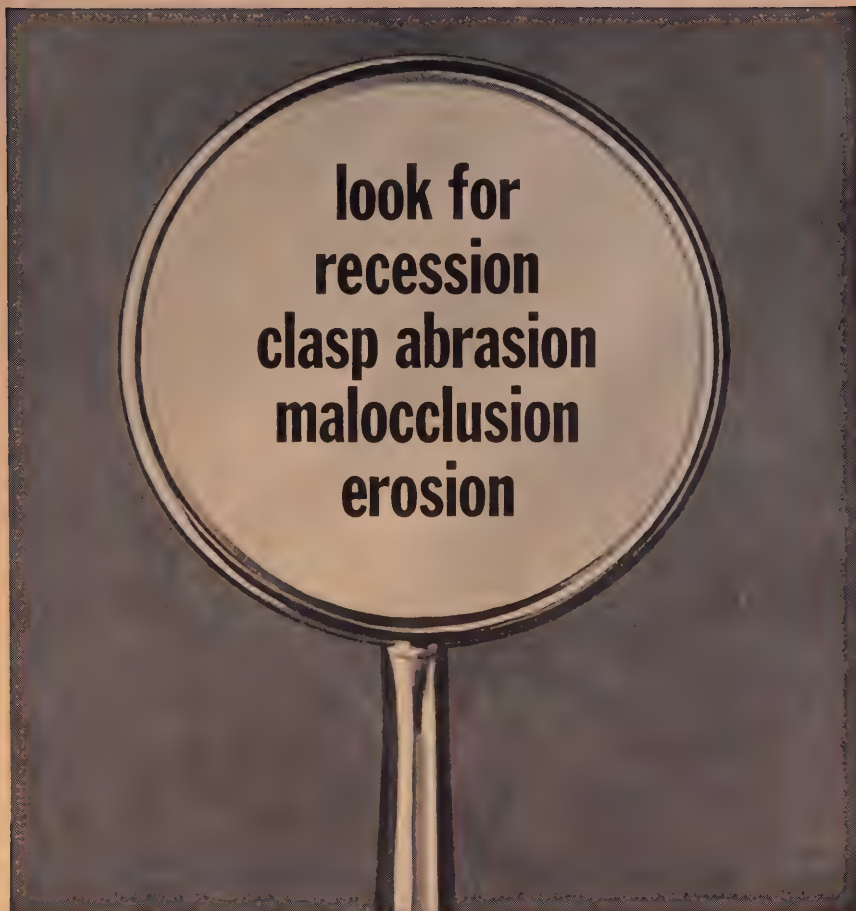
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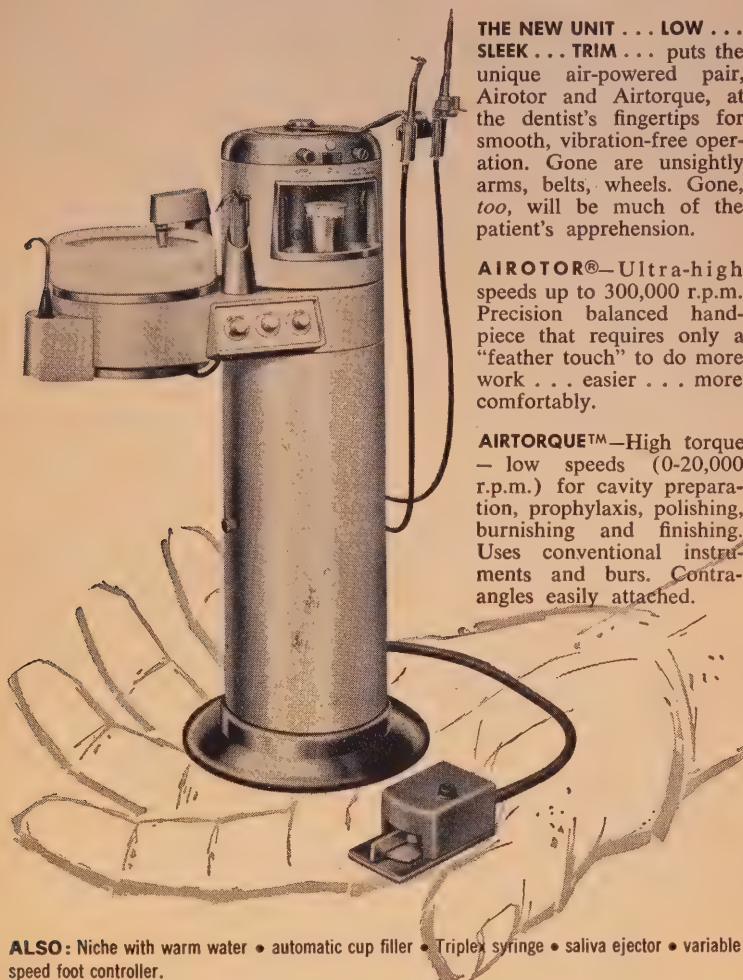


1. Perkins, Robert E.L.: Oral Surgery, Oral Medicine and Oral Pathology 10:230, 1957.

2. Sherber, D. A.: Am. J. Surg. 86:331, 1953.

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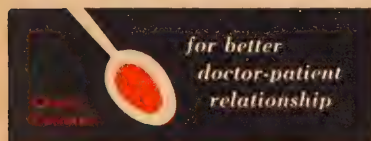
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(Continued on page 44)



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Bone meal (edible)..... 7½ gr. (0.5 G.)

An excellent source of calcium, phosphorus and trace elements, including fluorine.

Vitamin D..... 500 Int. units
Ensures adequate absorption of calcium.

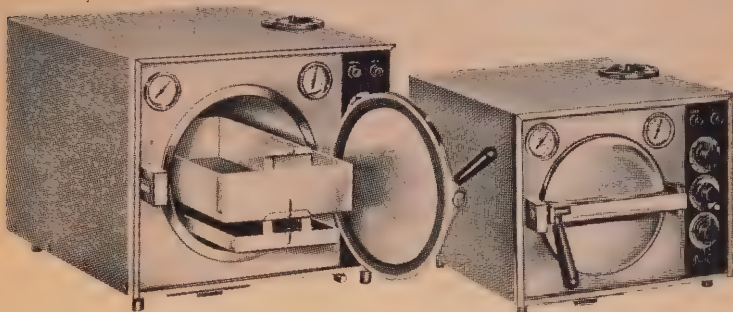
Vitamin C..... 37.5 mg.
For health of supporting tissues.

DOSAGE: Two tablets daily with water.

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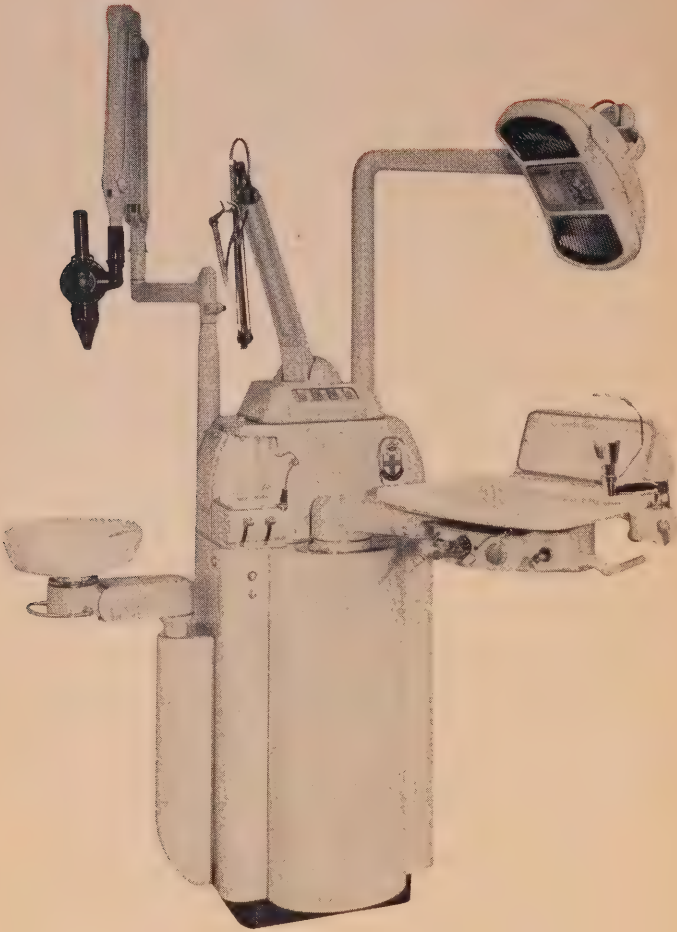
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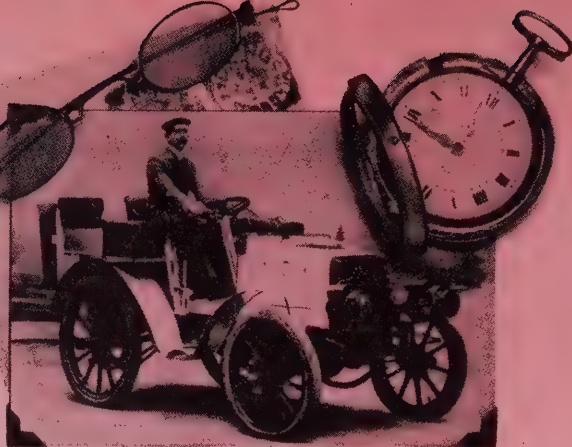
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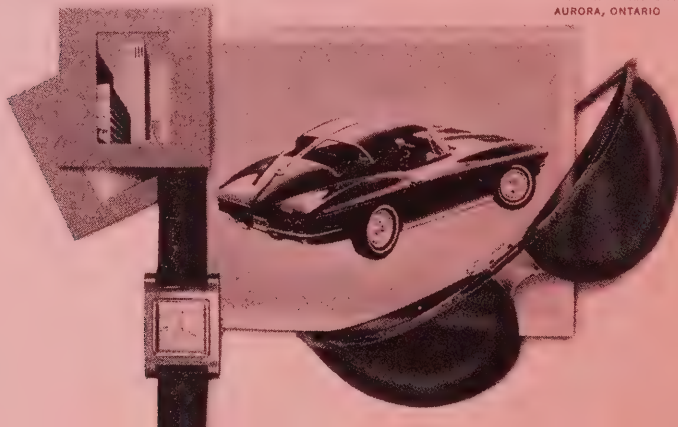
References: 1. Weil, C., Welham, F.S., Santangelo, C., and Yackel, R. F. Clinical Evaluation of Mepivacaine Hydrochloride by a New Method, J.A.D.A. 63:26 July 1961. 2. Dobbs, E.C., and Ross, N. The New Local Anesthetic, Carboaine, New York State D.J., 27:453 Nov. 1961. Other references to Carboaine total 156; more papers in press. Available reprints on request.

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1. J.A.D.A., 50:163, 1955. 2. J.A.D.A., 51:556, 1955. 3. J.A.D.A., 55:196, 1957. 4. J.A.D.A., 58:43, 1959. 5. J.D.R., 39:871, 1960. 6. J.D.R., 39:955, 1960. 7. J. Dent. Child., 28:5, 1961.



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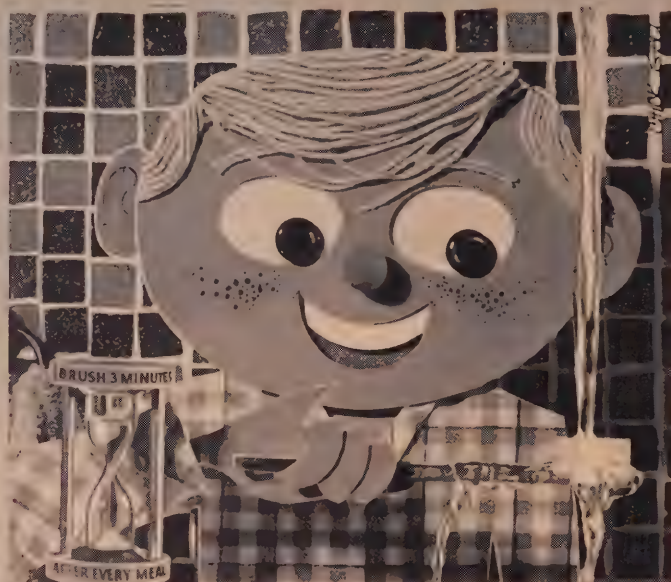
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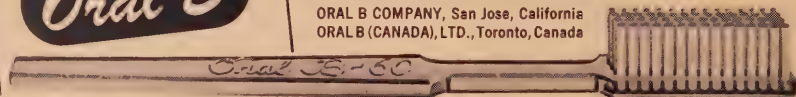
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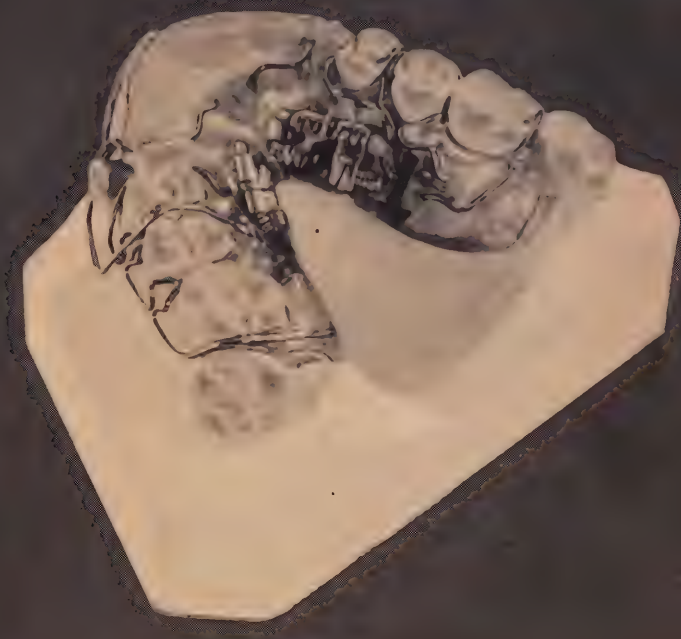
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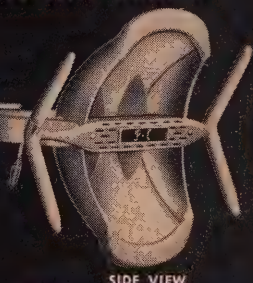
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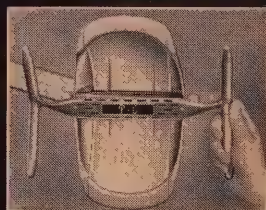
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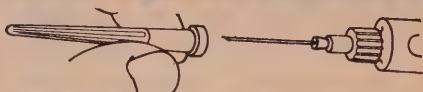
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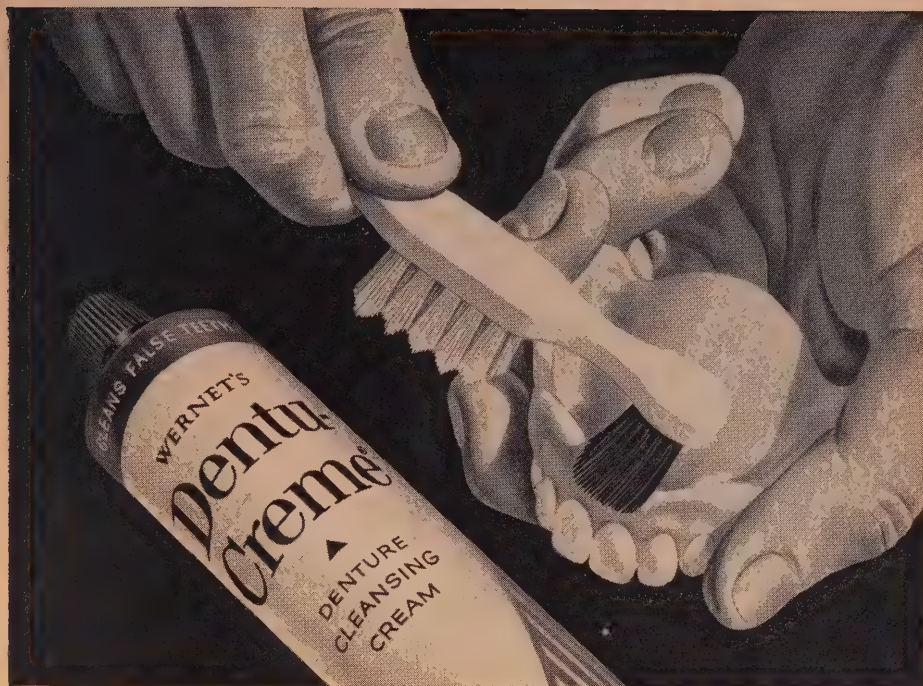
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Published monthly for the Canadian Dental Association by Gordon V. Allen Publications, 95 King Street East, Suite 205, Toronto, Ontario. Telephone 368-6251.

Gordon V. Allen, Advertising Manager.

Subscription price of Journal in Canada, Great Britain, the United States and all other countries, \$5.00 per year.

Authorized as Second Class Mail, Post Office Department, Ottawa, and for payment of postage in cash. All additions and changes of address should be sent to the Managing Director before the 20th of the month, to become effective the following month.

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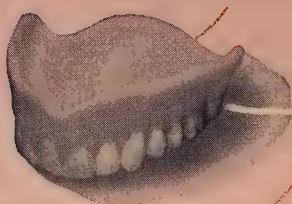
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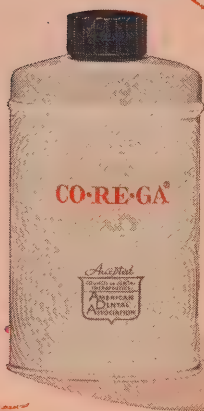
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The Canadian Dental Association

Volume 29
Number 2
Toronto
February 1963

JOURNAL

L'Association Dentaire Canadienne

**Tubules in the enamel and resorption under the
enamel deserve clinical consideration**

Z. Mézl, M.D., D.D.S., Montreal, P. Que.*

Prior to enamel formation, the inner dental epithelium is in contact with the dental papilla. When the dentine and the enamel matrix are formed, this epithelium and the odontoblastic layer of the pulp are progressively displaced from their original contact which then becomes the dentino-enamel junction. In multicusped teeth, as the enamel matrix growing down from the several cusp tips unites, the inner enamel epithelium between the cusp tips is squeezed into a fold. If the fold is shallow, it disappears. If there is

a deep fold, however, parts of the inner enamel epithelium will remain enclosed in the enamel matrix (Figure 1). As a result of this, spaces remain in the future mature enamel which may be either microscopic or visible, flat or tubular.

Hodson^{1,2,3} studied these spaces by micro-dissection and in histological sections. He named them tubular hypoplasias, tubular invaginations of the enamel capsule, tubule-like invaginations, enamel tubes, hypoplastic tubes, hypoplastic invaginations, and internal hypoplastic cavities.

Brabant and Klees⁴ described canals or pseudo-canals in the enamel in ground

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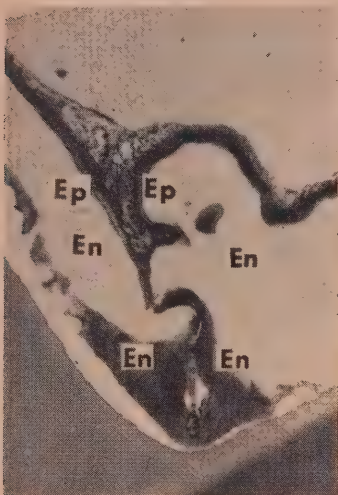


FIGURE 1 Photomicrograph of a section taken from a multicusped supernumerary tooth before eruption, showing the space between two cusps. The enamel was partly lost during decalcification leaving the empty spaces. Note the epithelium (Ep) squeezed into a fold between the enamel spaces (En) of the two cusps. The lower part of the epithelial fold forms a tubule enclosed in the remaining enamel. The bend in the tubule is an artefact. Haematoxylin-eosin, original magnification x 40.

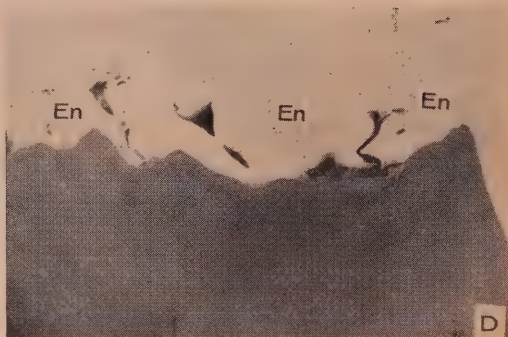


FIGURE 2 Photomicrograph showing part of the occlusal surface of a maxillary third molar. The enamel was mostly lost during decalcification. In the enamel space several tubules in longitudinal or oblique section can be seen. Haematoxylin-eosin, original magnification x 12.5.

sections of teeth, odontomes, and dens in dente. They also described a flat space occurring between the enamel and dentine which suggested an area of resorption.

TERMINOLOGY

The enamel tubules are microscopic canaliculi in the enamel, round or flattened on cross-sections, localized irregularly. They are an anomaly of development, not a constant element of the histological structure of the enamel. They result from epithelial inclusions, but in tubules of adult teeth the epithelium is no longer present. The enamel tubules are not invaginations in the usual sense of this word; the epithelium did not invaginate, it failed to recede and was surrounded by enamel. The enamel tubules

do not resemble hypoplasias in the usual sense. The primary cause seems to be the presence of epithelium and not an arrest of amelogenesis. Some tubules actually seem to result from inclusions between unusually thick layers of coalescing enamel.

MATERIAL AND TECHNIQUES

The enamel tubules were studied microscopically in histopathological sections of decalcified teeth collected at the Faculty of Dental Surgery, Université de Montréal. Routine serial celloidin sections of teeth were stained mainly with haematoxylin-eosin or haemalum-phloxine-safran. Ground sections of undecalcified teeth were also studied. Serial sections are advantageous in finding the tubules,

in following their trajectory and in distinguishing them from fissures.

The tubules were found mainly on occlusal surfaces of molars (Figure 2) and bicuspid. They are rare on smooth surfaces. The tubules are frequent in multi-cusped supernumerary teeth. They can be seen occasionally in odontomes, enamelomas and similar anomalies.

Most interesting were the sections made from third molars and supernumerary teeth extracted before and during eruption. These sections revealed a continuity between the contents of the tubules and the adjacent tissues and also showed this tissue to be vital.

THE TUBULES

The tubules are round or flattened on cross-section. The diameter of the thin-

nest ones is about 10 to 20 microns, just enough to contain a lining of flattened epithelium and a few mesenchymal cells (Figures 3 and 4). The average tubules measure from 30 to 70 microns or more in diameter, and contain an epithelial lining, loose connective tissue, narrow blood vessels and at the bottom, masses of a material of different characteristics: (1) enameloid globules or enameloid lamellae,⁵ birefringent when examined with polarized light in ground sections; (2) homogeneous material which is not birefringent in ground sections and which shows the same staining affinity as the organic structure remaining from the enamel in decalcified celloidin sections; and (3) degenerated or necrotic cells.

Some tubules measure about 30 microns at the surface and widen to 150 microns or more at the bottom. Sometimes a

FIGURE 3 A cross-section of the tubules showing an epithelial lining (Ep), a little connective tissue, and blood vessels containing blood in the right tubule. Maxillary molar, occlusal surface. Haematoxylin-eosin, original magnification x 400.





FIGURE 4 A longitudinal section of a tubule showing an epithelial lining, and an acellular material at the end. Remnants of the dissolved enamel may be seen around the tubule. Haematoxylin-eosin, original magnification x 400.

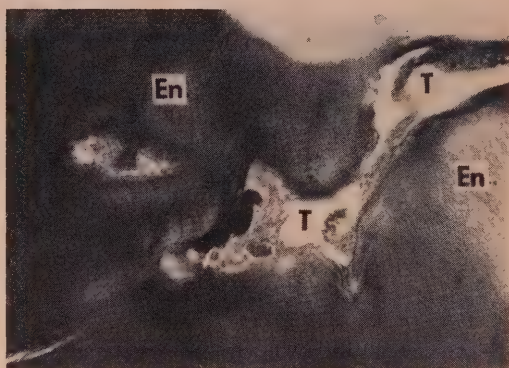


FIGURE 5 A tubule (T) entering the enamel in the right upper corner forms three ramifications in the middle of the layer of enamel. Note the epithelium, connective tissue, blood vessels, and a homogeneous dark material in the lumen. The section was taken from the occlusal surface of an irregular supernumerary tooth. Haematoxylin-eosin, x 160.

tubule forms ramifications (Figure 5). The tubules may end anywhere in the enamel or they may lead down to the dentino-enamel junction.

When the epithelium at the bottom of the inclusion remains at the dentino-enamel junction, several phenomena may occur. Five different phenomena were seen in our material: (1) complete interruption of the enamel; (2) interruption of the enamel with anomalous canaliculi in the dentine; (3) invagination in the dentine; (4) inclusion of dentine in the enamel, and (5) resorption under the enamel.

Interruption of the Enamel.—The epithelium remains in contact with the dental papilla and is not interrupted. No enamel is formed in this point; the surface of the dentine is normal (Figure 6). Remnants

of epithelium, enameloid tissue,⁵ or organic material may be seen lining the bottom of the tubule.

Anomalous Canaliculi in the Dentine.—The epithelium at the bottom of the inclusion and the surface of the dentine are interrupted by tiny orifices. Abnormal canaliculi are formed in the dentine under the enamel tubules (Figure 7). They are about 10 to 20 microns in diameter, and clearly different from the normal dentinal tubuli. They are in continuity with the enamel tubule.

Invagination.—The epithelium may proliferate and invaginate into the underlying tissue before dentine is formed and before there can be any inclusion. Later, the invagination is surrounded by dentine

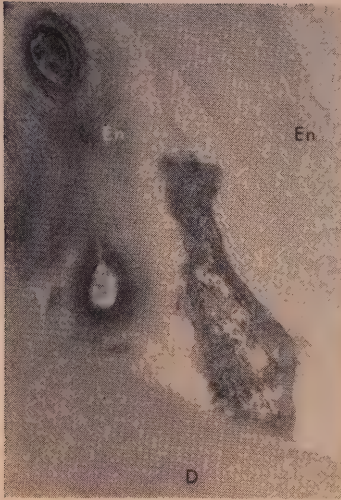


FIGURE 6 An enamel tubule with an epithelial lining reaching the dentino-enamel junction. Tubule cross-sections may be seen on the left. Haematoxylin-eosin, original magnification $\times 160$.



FIGURE 7 Abnormal canaliculi in the dentine under the bottom of a tubule in the enamel. Serial sections show that the canaliculi communicate with the enamel tubule. Haematoxylin-eosin, original magnification $\times 160$.

and a tubule is formed in the enamel. The invagination may show various aspects, such as areas of more or less degenerated soft tissue, enamelomas⁵ embedded in dentine, enamel invaginations, and dens in dente. In these cases, the primary process is one of invagination. Very few enamel tubules in clinically normal teeth belong to this category. Tubules with invagination into the dentine are more frequent in supernumerary teeth of irregular form.

Inclusion of Dentine in the Enamel.—When the epithelium at the bottom of the fold is interrupted, mesodermal tissue may proliferate beyond the future dentino-enamel junction. Later, it will form dentine or dentine-like tissue embedded in the enamel. We may find either a little area of dentine in the bottom of an enamel tubule, or larger dentine formations of irregular form and structure emerging into the enamel beyond the

original dentino-enamel junction. Most of these cases seem to be of traumatic origin. A mass of dentine protruding beyond the original dentino-enamel junction is known under the names odontocoele or hernia of the dental papilla.^{6,7}

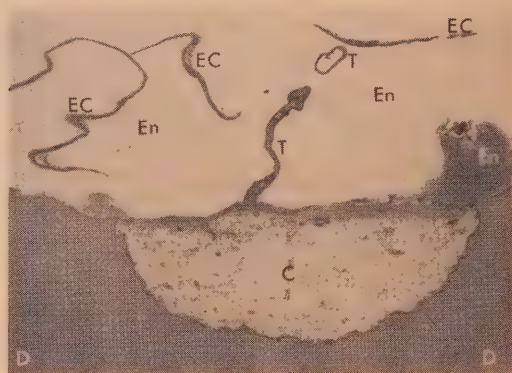
Obvious odontocoeles are rare, but small inclusions of dentine in the enamel are rather frequent, occurring mainly in bicuspids with slight traumatic dysplasias, probably due to premature extraction of a deciduous molar. When the calcified part of the crown is displaced during development, the dental papilla is deformed, the epithelium is interrupted, and the hard tissues form irregularly after the trauma. In the enamel, tubules leading to the traumatic deformation of the dentino-enamel junction may be seen. These enamel tubules may be partly filled by dentine (Figure 8).

Resorptions under the Enamel.—Resorption of the enamel and dentine may start at the bottom of deep enamel tubules and



FIGURE 8 A ground section of a mandibular bicuspid. A tubule in the enamel of the lingual surface contains dark organic material in the upper half. Dentine penetrates almost half of the thickness of the enamel. Evidence of traumatic origin can be seen in other areas of the section. Original magnification x 160.

FIGURE 9 Semicircular cavity (C) in the dentine (D) on the occlusal surface of a molar with incompletely developed root. The cavity contains mainly loose connective tissue. Note the resorption lacunae in the dentine and enamel, some containing osteoclasts. A tubule (T) winds through the enamel (En) from the cavity to the surface. The small oval (T) is a cross-section of the tubule (T) which can be followed in other sections of the series. The enamel (En) is mostly dissolved. The dark lines (EC) are rests of the enamel cuticle. Haemalum - phloxine - safran, original magnification x 40.



produce a cavity surrounded by enamel and dentine, communicating with the exterior only through the tubule. Cavities of various forms can be found. In some cases, mainly dentine has been resorbed (Figure 9), in other instances, mostly enamel has been resorbed (Figures 10 and 12), so that the cavity is flat on one side; then again, the resorption may advance in the enamel and in the dentine in such a fashion as to produce cavities with irreg-

ular forms (Figure 11). The walls of the cavity show resorption lacunae, and sometimes deep irregular recesses (Figure 11).

The cavity may reach a size that is easily visible to the naked eye in the section. If it reaches the surface of the enamel, its relation to the enamel tubule is no longer evident and it is indistinguishable from an area of superficial resorption. Clinically, after eruption, it

FIGURE 10 The cavity (C) is mainly in the enamel, with only few lacunae in the dentine. The bend in the enamel tubule (T) is an artefact. Haemalum-phloxine-safran, original magnification x 160.

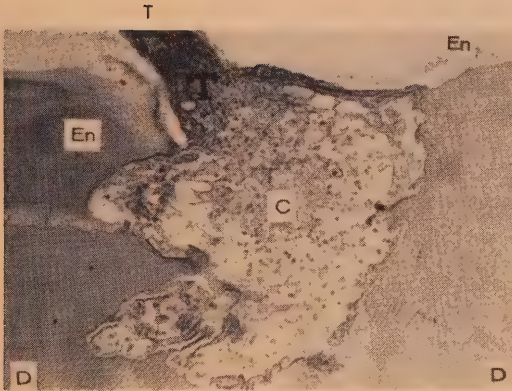
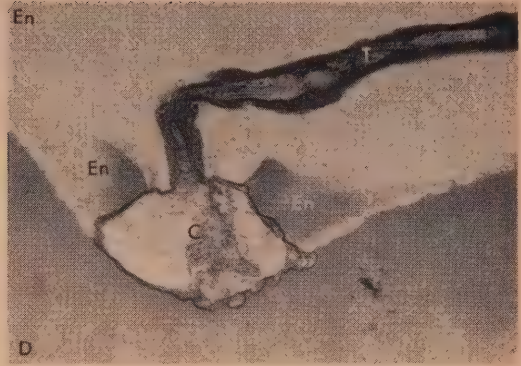


FIGURE 11 A cavity (C) and resorption in the dentine and enamel, with an enamel tubule (T). Note the irregular form of the cavity and the lacunae, some with a thin lining of cementum-like material. Haematoxylin-eosin, original magnification x 160.

FIGURE 12 A section from an erupted tooth. The cavity contains necrotic material, but the resorption lacunae and the normal aspect of the adjacent enamel and dentine indicate that this is not a carious lesion. Haematoxylin-eosin, original magnification x 160.



would be difficult to distinguish from a carious lesion.

The cavity contains loose connective tissue, fine blood vessels, and epithelium arranged as islets or bands, or as a partial lining on the walls of the cavity. Sometimes, there is a mild chronic inflammatory infiltration and foam cells (Figure 11). In cases where there is active resorption osteoclasts may be seen in lacunae in the enamel and dentine (Figure 9). In some cases, an amorphous or cementum-like material fills and covers the lacunae (Figure 11).

In our material, these resorptions have been found mainly on the occlusal surfaces of molars. One has been seen under an enameloma. While the enamel tubules are quite frequent, these resorptions seem to be rather rare.

DISCUSSION

After the eruption of the tooth, the tubules and the areas of resorption in the enamel contain necrotic material (Figure 12). The enamel tubules become accessible to micro-organisms. Their role in the initiation of caries would doubtless correspond to that of pits and fissures. Brabant and Klees⁴ have described a superficial carious lesion on a smooth enamel surface around a tubule. It is possible that a carious lesion, localized in an atypical area and difficult to explain otherwise, actually starts around an enamel tubule.

The enamel tubules associated with anomalous canaliculi in the dentine form a pathological communication between the oral cavity and the pulp. This communication may be important clinically and deserves further investigation.

The resorption under the enamel which is visible with the naked eye in the section could be seen in a good radiograph. After the eruption of the tooth, the clinical diagnosis of this resorption may be difficult, since it might easily be mistaken for a carious lesion. However, if this de-

fect becomes better known, these cases may be found more often clinically.

The cause of the resorption at the bottom of the tubule is difficult to explain. It is supposed that the reduced enamel epithelium protects the enamel from direct contact with the connective tissue. If this protection fails, the connective tissue resorbs the enamel or deposits bone or cementum on its surface. This concept of failure of the epithelial protection is a hypothesis only and poses other problems: why is the enamel sometimes resorbed and at other times covered by cementum?

The presence of osteoclasts in the cavity at the end of a tiny tubule can be explained by the theory that osteoclasts develop from undifferentiated mesenchymal cells. The theory that osteoclasts are formed by the fusion of osteogenic cells seems to be improbable in this instance.

CONCLUSION

The epithelial inclusions in the enamel form tubules and they may be associated with several other pathological phenomena, such as complete interruption of the enamel, anomalous canaliculi in the dentine, invagination, inclusion of dentine in the enamel, and resorption under the enamel. The study of these anomalies may contribute to several seldom discussed chapters of dental pathology.

RÉSUMÉ

Les canalicules dans l'émail résultent des inclusions épithéliales dans la matrice de l'émail au cours du développement. En relation avec les canalicules dans l'émail on trouve d'autres phénomènes pathologiques: Interruption complète de l'émail, interruption de l'émail avec canalicules anormaux dans la dentine, invagination dans la dentine, inclusion de dentine dans l'émail, et résorption au dessous de l'émail. Des considérations cliniques de ces anomalies-ci sont mentionnées.

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Method of making plastic teaching models for dentistry

E. R. Crocker, Toronto, Ontario*

Models used for record purposes in dentistry are generally of plaster or artificial stone. While these may be adequate in a private practice, they are not entirely satisfactory in a teaching institution, due to their fragility. Because of a demand for more durable and serviceable models for teaching oral anatomy, orthodontics, periodontics etc., a method has been devised for making plastic models which are as accurate as plaster but much stronger.

It is necessary to use a material for the mould that will duplicate the original model accurately and yet be compatible with the plastic used to form the cast. The most satisfactory results have been obtained by using a room-temperature vulcanizing silicone rubber. Once the mould is made it is possible to produce casts of original models in an epoxy resin. This material can be handled easily in its liquid form and it hardens to form a durable, good looking model adaptable to a variety of purposes.

The techniques for (a) forming the mould and (b) making the basic cast are here described together with some modifications that have been made for special purposes.

THE MOULD

Since the silicone rubber reproduces most faithfully even the finest visible scratch, the master model should be free of imperfections and highly polished. To ensure this the thoroughly dried plaster cast is immersed in hot soap solution at 200 to 210° F for ten to fifteen minutes and after slight chilling to between 170 and 180° F polished with a soft towel.

The silicone rubber is mixed on a glass slab with the catalyst in the proportions of 37½ cc. by volume of silicone rubber liquid* to five or six drops of catalyst.* This amount is usually sufficient to form

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*Silastic RTV 502 and catalyst, Dow Corning Silicons, Downsview, Ontario.



FIGURE 1 A silicone rubber mould, supported on a stone base. The interior of the mould is filled with a plaster core, around the edges of which recently poured soft epoxy resin has welled up.

a mould for one cast. If mixed in larger quantities the material may set before the moulding is completed, although the amount of catalyst may be lessened to lengthen the working time. Using a plaster spatula the catalyst should be incorporated into the silicone rubber liquid within one minute. The mix is then applied with a cement spatula over the occlusal surfaces and into the embrasures between the teeth, and application is continued into the folds and over the lingual and buccal surfaces of the cast. The cast is then placed on its base on a glass slab and the material applied over the art portions. Until the rubber has commenced to set (in ten to fifteen minutes) it must be worked up to the occlusal surfaces of the teeth. The tendency will be for it to sag to the slab and to the lingual aspect of the cast. Initially the material is quite sticky and lubrication of the fingers and spatula with a silicone compound† or

saliva will be found helpful. The finished mould should be one-eighth to one-quarter inch thick in cross-section. The material, if mixed as indicated, will set firmly enough to permit removal from the cast in one hour. However, twelve to twenty-four hours will produce a more resilient mould (Figures 1-5).

After the mould has set it should be released with the fingers around the edges of the art portion to a depth of approximately one-half inch, and then, without stretching, should be eased away from the master cast in a more or less straight occlusal path. Although this is a rubbery compound, it does not have sufficient elasticity to be peeled off the cast. Should a tear develop during removal or at some later date during the use of the mould, the surface may be cleaned with acetone and a repair made with a fresh

†Silicone 7 compound, Dow Corning Silicones.

mixture of the compound which will bond with the old mould.

THE BASIC CAST

Epoxy resin may be poured into the mould to produce a duplicate of the master model which will be a durable and faithful copy of the original. If a solid epoxy cast is desired it must be built up in layers. These layers will bond to each other but each should not exceed one-quarter inch in thickness, since the curing reaction is exothermic in nature and a thick layer will produce considerable heat which may cause porosity in the cast and damage to the mould. To avoid the hazards caused by heat and to save time and expense, it was found that a shell of epoxy resin around a plaster core was just as satisfactory as a solid plastic model. The following steps may be used to produce such a cast.

Preparation of Plaster Core

1. Fill the mold completely with a thin mixture of plaster of paris. Air bubbles in the crowns of the teeth are not serious since the crowns will be removed. Air bubbles in the body of the cast should be avoided as they can produce bubbles in the anatomical and art portions of the finished cast.

2. When the plaster cast has set it is removed from the mould and the crowns of the teeth are cut off at the cervical line. The anatomical part of the cast is reduced with a plaster knife by approximately one-eighth of an inch from all directions. The art portion, with the exception of the base, is reduced by a similar amount on a model trimmer, taking care to make each cut parallel to its original surface. The core should be thoroughly dry before using with the resin as moisture seems to inhibit the setting process.

Mixing of Resin and Hardener

Depending on the size of the casts being poured, 30 Gm. of resin* plus 7½ Gm. of hardener* will produce two to three casts when a plaster core is used in each cast.

1. Measure 30 Gm. of resin into a paper cup and place about fifteen drops on a glass slab.

2. To the resin on the slab add ½ Gm. of titanium dioxide powder† for colour and opacity and mix thoroughly with a cement spatula to a smooth, creamy paste. All the powder must be well milled into the liquid, otherwise settling will occur in the cast causing white specks in the crowns of the teeth.

3. Add 7½ Gm. of the hardener (No. ZZL 0814) to the resin in the cup and two to three drops of a supplementary stock colouring solution.‡

*Bakelite Epoxy Resin ERL 2795 and Bakelite Epoxy Hardener ZZL 0814 are obtainable from the Bakelite Company, Belleville, Ontario. The Bakelite Company advises caution in handling epoxy resins and hardeners. Areas of the body which accidentally come into contact with the resin or hardener should be washed clean with denatured alcohol and then scrubbed with soap and water as soon as possible.

†Titanium dioxide obtainable from Canadian Titanium Pigments, Montreal.

‡If the epoxy resin is used as supplied it will be an amber colour when cured. The following colouring solution may be used to produce casts of an ivory or light cream colour which are more pleasing aesthetically.

(a) Measure 30 Gm. of epoxy resin (ERL 2795) into a glass bottle. Place about 5 c.c. of this on a glass slab.

(b) To the resin on the slab add 100 mg. of Oil Yellow AB dye powder (obtainable from the Dye and Chemical Co. of Canada, Kingston) and incorporate thoroughly. This dye imparts an ivory shade to the resin.

(c) Add this mix to the balance of the resin in the bottle to form a stock colouring solution which may be stored and used as desired.

The supplementary stock colouring solution does not displace necessity for the incorporation of titanium dioxide powder with each fresh mix of resin. Because it will settle out, titanium dioxide cannot be incorporated with the supplementary stock colouring solution.



FIGURE 2 (a) a plaster model, and (b) the epoxy resin duplicate. These models have been used for teaching orthodontic techniques, and show the molar band and lingual and buccal tubes on the master model, and the tubes on the duplicate model in an identical position.

4. To this add the titanium dioxide mixture from the glass slab and stir for approximately one minute or until the colour is uniform. It is important to avoid the incorporation of air bubbles as these may cling to the sides of the mould during pouring.

Pouring

1. Pour as you would any impression, being careful not to entrap air on the occlusal and incisal surfaces of the teeth. Fill the mould approximately one-quarter full and with the cement spatula coat all the inner surfaces of the mould with the mixture.

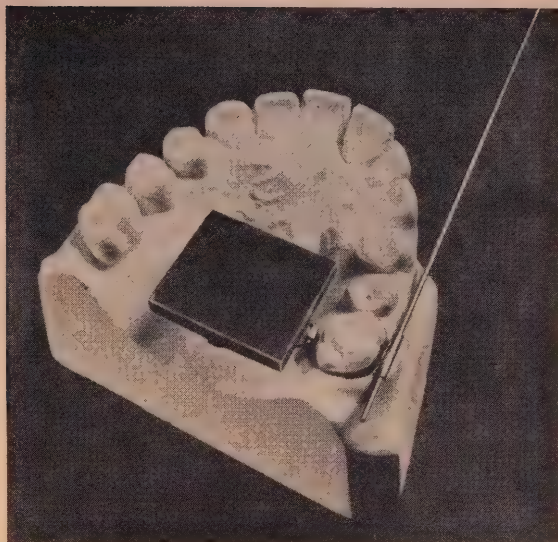
2. Centre the core in the mould and add additional resin to fill it brimful (Figure 1). A certain lowering of the level is to be expected as the core will absorb a small amount of the resin.

3. Clean the glass slab and spatulas with acetone immediately after use, since the epoxy resin will bond to them as it sets.

Separating

Three to four hours must elapse until the mould is thoroughly set to permit removal from the model in the same

FIGURE 3 A master cast showing the brass plate index for the lingual tube and the wire index for the buccal tube both in position prior to making the mould.



manner as described earlier. Care must be exercised to avoid cuts to the hands from the sharp edges of the flash.

SPECIAL CASTS

The epoxy resin basic cast has proven to be a valuable teaching aid in the dental school. The technique for production of the casts is adaptable to a variety of purposes, and three such special adaptations which have been developed are described below.

1. Cast for Teaching Orthodontic Technique

A cast has been developed to assist in teaching students the techniques of fabricating an incisor and a molar orthodontic band together with subsequent at-

tachment of buccal and lingual tubes to the molar band. The basic idea was to produce a plastic cast with a buccal and lingual tube in position on the molar opposite that to be banded by the student, which would serve as a pattern for the student. The model selected for duplication had diastemata in the bicuspid, cuspid and incisal regions. Since the students were to fabricate the band as though just below the free gum margin, the gingival portion of the cast was trimmed slightly around the teeth to be banded, and the selected molar was banded and buccal and lingual tubes fastened in place (Figure 2[a]).

Before making the mould an index plate for the lingual tube was fabricated from one-eighth inch brass plate. The plate was cut about $\frac{3}{4}$ inches square, and a shaft to fit the molar lingual tube was soldered to a U-shaped piece of wire and

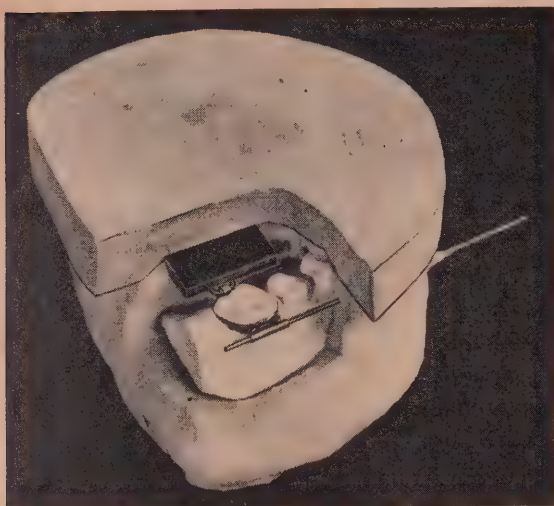


FIGURE 4 A cut-away view showing the master cast with the buccal and lingual tube indices in place, and their relation to the finished mould and the stone base.

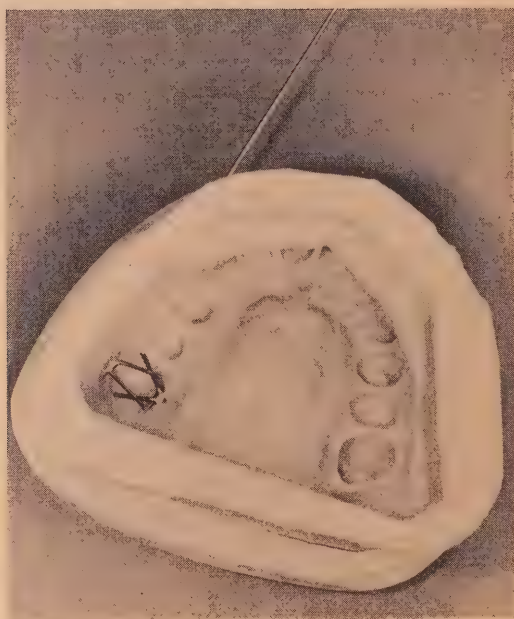


FIGURE 5 A view of the inside of a mould showing the buccal and lingual tubes in place ready for pouring the cast. The V-shaped retention wires are clearly visible and the index wire for the buccal tube can be seen extending anteriorly beyond the mould.

attached to the edge of the brass plate so that the shaft was at right angles to the flat surface of the plate and about 1/32 of an inch from the edge (Figure 3). When the shaft was placed in the lingual tube the index plate was held approximately parallel to the base of the cast.

Next, a straight piece of wire about 4 inches in length which fits the lumen of the buccal tube snugly was inserted in the tube to act as an index for it (Figure 3).

With both these indices in place, a mould was formed as previously described. The rubber was carried around the wire leaving about 1½ inches of wire protruding beyond the mould anteriorly (Figure 4), and was filled in between the cast and the brass plate to the level of the upper surface of the plate but leaving this surface exposed. The material was then carried up and over the occlusal surfaces of the teeth to a depth of about ¼ of an inch and levelled off approximately parallel to the base of the cast. After the moulding material had set and before it was separated from the cast, an artificial stone base was poured over the brass plate and over the base of the mould. The base of this stone index was kept parallel to the base of the cast since it was intended not only to keep the brass plate in place when pouring the casts but also to keep the mould level. Figure 4 shows a view of the basic model with the molar band and tubes in place and with both the wire and brass plate indices also in place. The moulding material and stone index have been cut away to show the assembly.

Before separating the mould from the master cast, the stone base was removed and the index wire withdrawn from the buccal tube. Then the brass plate index was lifted from the bottom of the mould in a vertical direction being careful not to bend the shaft as it emerged from the lingual tube; then the mould was removed from the master cast as described previously.

Using this mould, plastic models were fabricated as follows: First the plaster

core was prepared as for the basic model. Next, two one-inch lengths of arch wire were bent into sharp V-shapes and a lingual tube was soldered to one of the wires and a buccal tube to the other. The brass index plate was seated in its location in the mould and the mould placed on the stone base. The lingual tube (attached to its V-shaped wire) was mounted in position on the shaft on the brass plate (Figure 5). Next, the buccal tube, with the V-shaped wire attached, was seated in place in the impression left by the tube on the master cast, and the index wire inserted through the mould and through the tube (Figure 5). The exposed ends of the lingual and buccal attachments were sealed with a drop of wax to prevent the resin from entering* as the cast is poured. Finally, the plastic was poured into the mould as previously described and the plaster core placed in position, the latter having been relieved sufficiently in the area of the projecting V-shaped wires to avoid contact.

When the model had set the stone base was removed, the index wire withdrawn from the buccal tube, the brass plate withdrawn from the lingual tube (again being careful not to bend the shaft attached to the brass plate) and the cast removed from the mould. The final cast had an outline of the molar band, and a buccal and lingual tube in place exactly as on the master cast (Figure 2[b]).

Since acrylic will not bond to epoxy resin, acrylic "sprinkle plates" were made directly on the epoxy casts without applying tin foil or tin foil substitutes.

2. Cast for Teaching Occlusal Correction by Grinding

For teaching the techniques of correcting occlusal abnormalities by grinding it has been found helpful to use articulated casts on which grinding can be done, and to use duplicate casts for comparison after

*A light coating of *Silicone 7* compound is advisable on the brass plate, shaft, wire, and both tubes to prevent any resin that might enter from sticking.

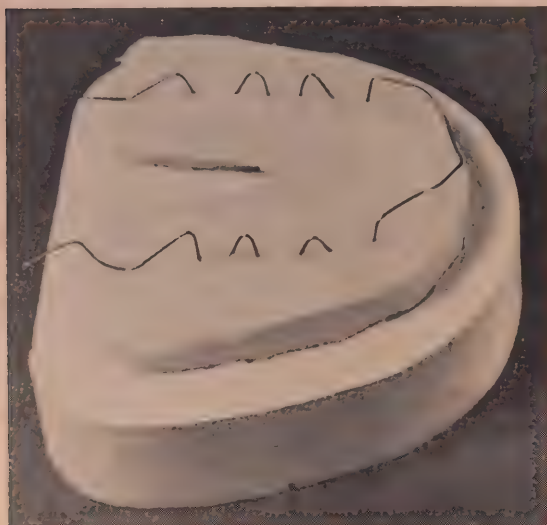


FIGURE 6 A stone base supporting a silicone mould. Plastic fills the mould and the wire retention loops are visible, the ends of the wire resting on the edges of the mould.



FIGURE 7 Casts for occlusal correction exercises finished for mounting. The retention wire loops are visible above and below the casts. The darker colour in the teeth in the incisal and occlusal two-thirds of the crowns is due to the added powdered human teeth.

treatment. To make the most of such casts they should be of approximately the same consistency and offer the same resistance to cutting as do natural teeth.

The method for the preparation of such casts was as follows:

Since these casts were to be mounted on an articulator and since only the

crowns of the teeth were required for the exercise, the casts were not too bulky and only extended about $\frac{1}{4}$ inch above the cervical line of the teeth. The casts were made without plaster cores, and even though the original mould was made somewhat deeper, the level of the resin within the mould was not permitted to exceed this $\frac{1}{4}$ inch limit above the cervical line, since the setting would have been too rapid and too much heat given off, causing risk of damage to the mould. Since the mould is more or less horse-shoe-shaped before removal from the master cast, an index of it was made in stone for support while pouring resin (Figure 6).

To produce casts with teeth sufficiently hard to offer similar resistance to cutting by a stone as do natural teeth, 20-30 cc. of human teeth, pulverized up to 60 mesh, were added to each 66 c.c. of resin. To avoid discolouration of the casts, as much old filling material as possible was removed from the teeth before pulverizing.

The casts were then produced in the same manner as the basic cast with the following exceptions:

1. An additional 50 milligrams of titanium dioxide was added to each mix to help overcome any discolouration brought about by minor amounts of amalgam left in the pulverized mixture of teeth.

2. The crowns of the teeth were poured in plastic before adding the tooth powder because the ground human tooth substance thickened the mix and increased the risk of trapping air bubbles. After the crowns were poured the human tooth powder was added to the balance of resin remaining in the mixing cup. The mixture was stirred vigorously and immediately poured into the mould. The tooth powder does not stay in suspension, but settles to the bottom of the mould, i.e. into the occlusal and incisal portions of the teeth (Figure 7).

3. A piece of 18-22 gauge wire was bent into a series of loops as shown in Figure

6 and placed so that one half of the loops were embedded in the resin. The other half of the loops projected up into the air by resting the tag ends of the wire on the edges of the mould (Figure 6). The size of the wire loops was small enough to preclude their extension into the crowns of the teeth where they might interfere with the grinding exercise. This wire provided the means of attaching the cast to the plaster used in mounting on the articulator.

Figure 7 shows a set of casts ready for mounting. The difference in colour in the teeth is due to the settling of the pulverized tooth powder into the incisal and occlusal portions of the teeth.

3. *Two-Tone Casts for Demonstration and Teaching*

All of the casts heretofore described have both teeth and the anatomical and art portions in one colour. For demonstration or record purposes it is often desirable to use more aesthetic casts. These may be produced solely in acrylic resin but the techniques of producing models in acrylic result in some shrinkage so that the final cast is not a true duplicate of the original model. More accurate duplication is possible by combining the technique of producing casts in epoxy resin with that of using acrylic resin — the teeth being made in epoxy resin, and the gum and art portions in coloured acrylic resin. This is simpler than producing the total cast in two colours of epoxy resin, since the teeth once made, readily float out of their position in the mould when the liquid plastic to form the gum and art portions is poured over them.

To make the combined acrylic-epoxy cast, the crowns of the teeth are poured in epoxy resin bringing the resin to a depth of about one-quarter of an inch above the cervical line. After it has set the teeth are removed from the mould and excess material trimmed away above the cervical line, leaving only an index of the root portion extending beyond the

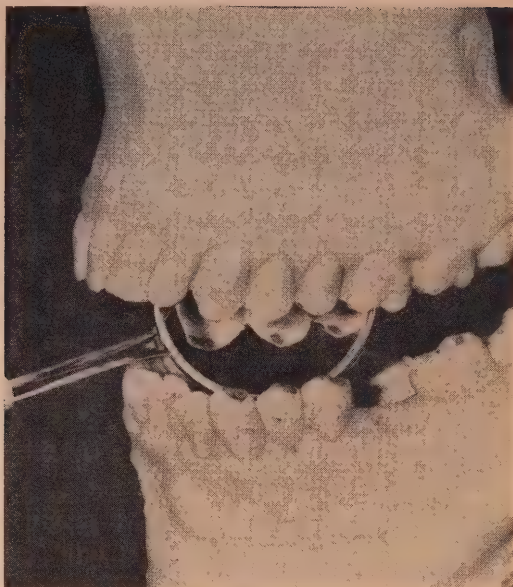


FIGURE 8 A set of casts for teaching occlusal correction exercises, mounted for use, showing the articulator paper markings on the teeth.

crown. Suitable undercuts are placed in these root indices to retain the acrylic material which will be processed against them. The teeth are placed in the mould and while steadying them in position with one hand, molten wax is slowly poured into the mould to a depth of about the apex of the epoxy roots on the teeth. After this wax has set (which will retain the teeth in position) more wax is flowed around the balance of the anatomical and art portions of the mould to a thickness of between $1/16$ to $1/8$ of an inch. The shell of wax thus formed is filled with plaster. After the plaster has set, it is removed together with the wax and the teeth from the mould and processed in the same manner as for an acrylic denture. The model should not be boiled for a long period when removing the wax since prolonged boiling has a tendency to soften the epoxy cast and darken the yellow dye in the teeth. It has been

found that self-curing acrylic is quite suitable in the production of such models.

RÉSUMÉ

L'auteur décrit une méthode pour confectionner des modèles en plastique pour l'enseignement dentaire. Il faut d'abord préparer un moule qui reproduira parfaitement le modèle original et qui pourra tolérer le plastique en donnant une copie du modèle. On obtient les meilleurs résultats pour ce moule en se servant, à la température de la pièce, d'un caoutchouc de silicone qui se vulcanise. On peut ainsi confectionner des copies du modèle original en résine epoxy.

On mêle sur une plaque de verre 37.5 cc. de caoutchouc de silicone liquide avec cinq ou six gouttes de catalyseur. Cette pâte est d'abord enduite sur les surfaces

occlusales et aux points de contact des dents et ensuite sur les côtés linguaux et buccaux du modèle. Le modèle est déposé sur la plaque de verre et on finit de le couvrir à la voûte palatine ou à sa partie linguale. Le moule devrait avoir $\frac{1}{8}$ ou $\frac{1}{4}$ de pouce d'épaisseur. Le matériel durcit assez rapidement pour qu'on puisse le retirer du modèle après une heure; mais il est préférable de le laisser en place 12 ou 24 heures: il est alors plus dur.

On prépare le modèle qu'on veut reproduire en lui donnant la forme d'une coquille soutenue par un support en plâtre; ce support se prépare en emplissant le moule d'une mince couche de plâtre. On enlève ce contre-moule en plâtre quand il a durci et on coupe les couronnes des dents à la ligne cervicale. La partie du support qui fait face aux structures anatomiques est alors diminué d'environ $\frac{1}{8}$ de pouce dans toutes les directions; la partie de l'arche, moins la base, est aussi réduite d'autant sur le tour. La coquille de résine, si l'on y dépose 30 Gm. de résine plus $7\frac{1}{2}$ Gm. de durcisseur et si on se sert d'un support de plâtre pour chaque cas, pourra donner deux ou trois modèles. On mesure les 30 Gm. de résine dans un verre de papier et on dépose sur

la plaque de verre quinze gouttes de résine; on y ajoute $\frac{1}{2}$ Gm. de dioxyde de titane. On mêle intimement la poudre et le liquide. Ensuite, on ajoute $7\frac{1}{2}$ Gm. de durcisseur de résine et 2 ou 3 gouttes de solution colorante à ce qui reste de résine dans le verre de papier. On y ajoute le mélange de dioxyde de titane de la plaque de verre. Le tout est agité durant environ une minute jusqu'à ce qu'il ait une couleur homogène. L'ensemble est ensuite coulé dans le moule jusqu'à ce que celui-ci soit au quart plein; on en enduit les faces intérieures du moule. Le support de plâtre est alors centré autour du moule en y ajoutant la résine qui reste jusqu'à ce qu'il soit bien rempli. Il faut attendre 3 ou 4 heures avant que le modèle soit complètement pris avant de le sortir du moule.

L'auteur termine en décrivant les occasions où des modèles du genre peuvent servir: enseignement des techniques d'orthodontie et de celles de la correction des malocclusions par le meulage. Des modèles en deux teintes peuvent aussi servir pour des démonstrations et l'enseignement en général.

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Dental photography for the practising dentist

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Clinical dental photography for the practitioner is developing into a standard pro-

cedure. Many dentists have coloured slides of the clinical appearance, showing before and after views, attached to the patient's record for future reference. This type of photography can be accomplished with a minimum of expenditure for pho-

Presented at the Annual Meeting of the Canadian Dental Association, Vancouver, June 4, 1962.

*Director of Health Sciences Television and Dental Photography, University of Washington.

tographic equipment but the results attained are of minimum quality. For those who use photography to demonstrate clinical techniques for scientific meetings, study clubs or teaching a better photographic slide is needed. It is this type of quality and equipment that will be discussed.

QUALITY

The inexpensive fixed focus clinical camera produces slides that are not intended for large magnification. When enlarged, these slides are not critically sharp. If a slide does not show the fine dental detail needed, the clinician's time and that of his audience is wasted. To produce a slide or photograph that is critical in its focus and one that has good colour fidelity requires not only a good camera, but good visualization on the part of the person using the camera. It is necessary to work with the equipment until you produce the results which have the necessary detail and colour balance to best illustrate the object being photographed. Only then are you ready to standardize your procedures for future slides.

Some clinicians and lecturers show poor photographic slides of dental preparations. By using good illustrative material, the presentation is not only easier to understand, but the audience is left with the feeling of an excellent program. Poor quality in any illustrative media will ruin an otherwise good presentation.

CAMERA EQUIPMENT

Like most other equipment it is necessary to buy good photographic equipment to achieve good results. Camera equipment should be as versatile as possible and always ready for the making of a clinical slide. If more than three or four minutes are spent in making a clinical slide the photographic equipment used is

not well adapted to the individual's practice.

For good dental photographs of patients, casts, copy work or radiographs, a 35 mm. single lens reflex camera with a fully automatic lens attached to a double track bellows for focusing is ideal. Depending on the make of the camera, a 90 mm. to a 135 mm. lens should be used. The make of the camera is not important as long as it is easy to load, has shutter speeds of 1 second to a minimum of 1/300 of a second, plus provisions for time and bulb exposure. The shutter must have M or X synchronization or both, depending on the type of lighting that is used. An accessory lens and bellows should be readily adaptable to the camera body. The view finder and range finder should produce a sharp crisp image at all magnifications of the exact subject area. With a double track bellows, the camera and lens combination will photograph a close-up of three upper anterior teeth in a one to one ratio. By shortening the bellows the combination will include a full-mouth view or a nose to chin area. With the bellows removed a full face view to a regular infinity area may be made. A 100 mm. fully automatic lens allows the greatest versatility in image size and lighting control, while keeping the camera far enough away from the mouth to produce slides with a minimum of image distortion and lighting discomfort to the patient. When using a single lens reflex camera with a bellows separating the automatic lens and camera body, it is necessary to use a double action cable release to connect both.

LIGHTING

With the 100 mm. lens a point source of light should be used at the side of the camera and as close to the lens-to-film axis as possible, thereby producing a slide that will project with a decided increase in image crispness and brilliance over slides that are made by ring light.

The use of a ring light for intraoral or cavity photography has some advantages

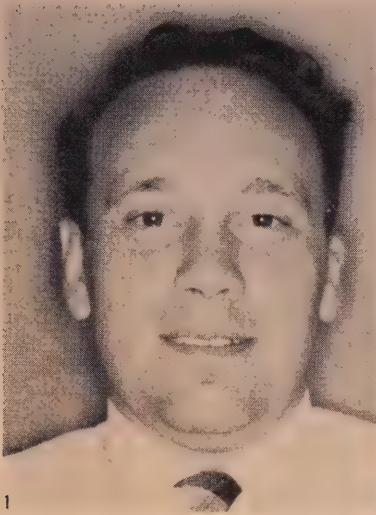


FIGURE 1 Copy from a 2 x 2 colour slide. The hazy shadow around the head is caused by ring light illumination when used with a short focal length lens.

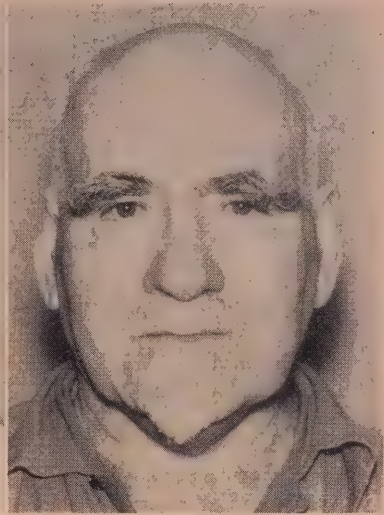


FIGURE 2 Copy from a 2 x 2 colour slide. 100 mm. lens and point source of light. The print has a crisp outline and definite shadows and contrast.

but also many disadvantages. A few of the advantages are: components may be purchased already assembled and ready for use, and camera and light assemblies may be small and compact, easy to hold and convenient for quick pictures. Disadvantages of the ring light may rule out its use for some types of critical photography. A 360° light produces a hazy shadow all around objects of three dimensions when these objects are not extremely close to a background. Examples would be a full face view of a patient or a small object photographed in a similar camera and background position. When a black background is used to eliminate the shadows around a model, some picture clarity is lost because the periphery of the tooth or object photographed will blend in with the background. A ring light will produce less contrast for proximal separation, mesial to distal tonal sep-

aration of teeth, or the good rendition of a lesion or area of swelling, than other types of light. The ring light must rely entirely on colour separation for its contrast. When colours are of close value, such as the off-white colour of teeth and the very light pink of gingival tissue, the contrast is not always adequate for good separation. The colour slides from a ring light, when copied, will generally not make good black and white prints for publication because the lighting is too flat for good contrast separation of the tone of teeth and tissue. With a ring light it is impossible to crosslight wear facets on occlusal surfaces, lesions or any area where crosslighting would enhance the general detail needed.

The point source of light, when properly mounted, will give excellent illumination to the entire oral cavity with a minimum of shadow while producing the

modelling that is necessary to show the best detail. A small 3 inch or 4 inch reflector from electronic flash equipment should be attached to the side of the camera on the lens-to-film axis. This light reflector position will produce a colour or black and white slide with the maximum crispness and image clarity. When using this type of light each interproximal space will have a slight hairline shadow separating the teeth. Each tooth will have mesial to distal modelling of light with a slight distal shadow giving it better separation. Lesions will photograph more lightly on one side, with a small shadow behind giving maximum form and contrast while showing the best image brilliance. Patients or objects photographed on colour slides can be copied and reproduced as excellent black and white prints when photographed originally by a point source of light.

The following types of dental photography may be accomplished with a reflex camera and bellows with a 100 mm. lens:

1. Intraoral and general patient photography. — For this purpose a point source of light or ring light is attached to the camera bellows, projecting light into the mouth on the lens-to-film axis. The camera may be supported by hand or placed on a tripod or special mount.

2. Photography of models, casts or small objects. — These objects may be photographed with a stroboscopic light attached to the camera as for intraoral photography. Better results will be attained by placing the camera with a bellows on a tripod. The object or model should be illuminated by one or two small spotlight bulbs attached to stands. If a single light source is used it should be one or two inches above the camera and on the vertical lens-to-film axis. Two lights at a 45° angle or less, but at the height of the occlusal plane should be used to illuminate full-mouth casts. Depending on the contrast desired, one light

may be moved back from the subject to produce more contrast.

The problem of shadows in the photography of small objects such as bridges, jackets or crowns is avoided by placing the object on a piece of plate glass that is suspended five to eight inches from a background. With the light and camera both pointed directly down on this area, the shadows cast by the light may be kept out of the photographic field.

In the photography of any object, large or small, it is desirable to use as few lights as possible, but use them carefully for good shadow modelling.

3. Photography of radiographs or slides. — The radiographs or coloured slides to be copied are placed on a piece of opal glass that has been masked with black tape or paper to the desired slide size to exclude most of the unwanted illumination. We illuminate the slide from behind with a 3,400° tungsten light which is eight or ten inches from the slide or radiograph. The camera should be on a tripod. The amount of light being transmitted through the radiograph or slide is measured with a photographic meter and the correct exposure calculated for black and white or colour film. When using a bellows for close-up photography, the effective aperture must be established by application of the inverse square law. For example, if a 4-inch lens is extended to 8 inches, which would be a one to one ratio, the exposure would have to increase 4 times. A stroboscopic light may also be used for copying slides and radiographs on daylight type Kodachrome film. We follow the same procedure as for tungsten illumination, except that the exposure must be estimated for the light source to film distance while transilluminating the slide to be copied. The watt-seconds output of the stroboscopic light as well as the inverse square law must be considered in calculating the correct exposure.

4. Copying charts and graphs. — The material to be copied is placed flat on the wall. Two lights at 45° should evenly

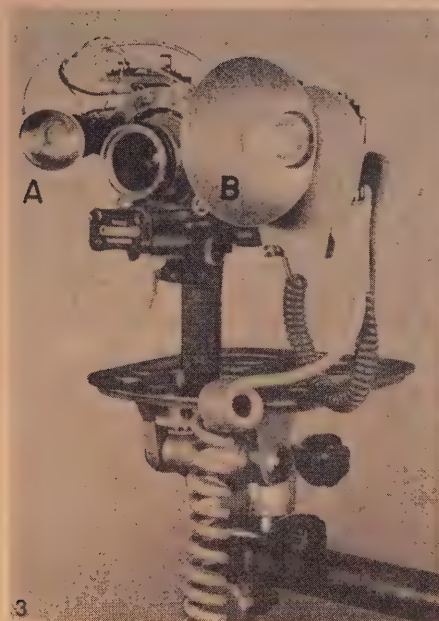


FIGURE 3 Lateral view of the clinical camera showing (A) 2.5 volt focusing light, and (B) stroboscopic reflector attached to the side of the camera bellows on the lens-to-film axis.

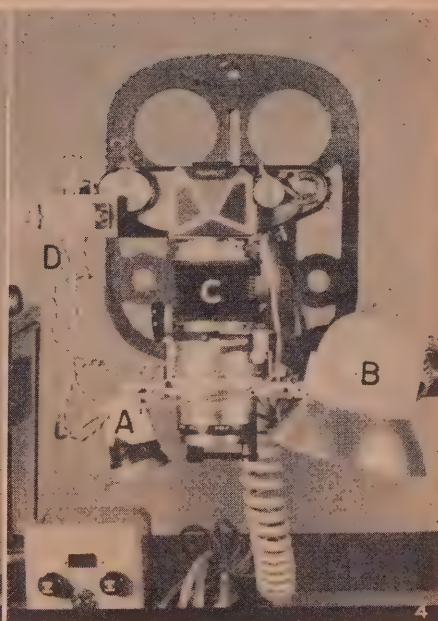


FIGURE 4 Top view of the clinical camera showing (A) 2.5 volt focusing light, (B) stroboscopic light, (C) bellows, and (D) double cable release.

illuminate the material. By means of bellows the camera is focused for size and sharpness. We determine the correct exposure for the film used, and calculate the effective aperture. Black and white high contrast film should be used for a good negative of line copy. Regardless of whether the illustration material to be photographed is coloured or black and white, if colour film is used for copying, Kodachrome II film will produce a slide with excellent contrast and detail.

Exposure and film.—For intraoral or general clinical colour photography, Kodachrome II film will also give the best

colour fidelity. With a 200 watt-second electronic flash that has a 3-inch or 4-inch reflectored point source of light, the exposure will be approximately $f32$ at $1/50$ second with a 100 mm. lens on a bellows. For a full-mouth view the light should be held or mounted on the lens-to-film axis half-way between the front of the lens and the front of the camera body, with the flash reflector held about 14 inches from the anterior teeth. For a view of just the anterior teeth, the camera lens will be approximately 11 inches from these teeth. As the camera and bellows are moved back the light will also move back. The exposure will remain the same because the bellows in focusing be-

come shorter and the image area becomes larger, thereby offsetting any difference in exposure.

If the electronic flash equipment used for intraoral photography produces a slide that has too cold a tissue colour, a colour correction filter should be used to warm the over-all effect. A cc $\frac{1}{8}$ or cc $\frac{1}{4}$ filter is generally all that is required.

A meter reading must always be calculated except when making clinical photographs using flash or stroboscopic illumination. Exposure meter readings of objects or copy material are best taken from the neutral grey side of the test card available from the Eastman Kodak Company. The card is placed in the exact position and plane of the material to be copied and a direct reading is taken.

SUMMARY

As with everything accomplished, time expended determines the general results we attain. To produce good photographic results, the practitioner must purchase good equipment, must spend adequate time to set it up and must thoroughly familiarize himself with its operation. By spending this time in the beginning, he will waste very little time and film subsequently in attaining excellent photographic results in the day by day application of clinical photography to his practice.

RÉSUMÉ

L'appareil idéal pour photographier des patients, des modèles, des duplicata et des radiographies, etc. doit être une caméra de 35 mm., à lentille simple réflexe avec une lentille complètement automatique fixée à un double charriot pour la mise au point. Une lentille de 90 mm. à 135 mm., selon la marque de la caméra, est de mise. La caméra doit être facile à charger, avoir un diaphragme oscillant entre 1 seconde et 1/300 de seconde et un disposi-

tif pour régler l'exposition et pour utiliser une ampoule. Le diaphragme doit avoir une synchronisation de M ou X, ou les deux, selon le genre d'éclairage utilisé. Il serait bon qu'une autre lentille et un autre charriot soit disponibles pour les fixer à la caméra. Le viseur et le télémètre doivent donner une image nette et montrer clairement les alentours du centre d'intérêt.

On devrait utiliser avec une lentille de 100 mm. une petite source de lumière au côté de la caméra et placée aussi près que possible de l'axe lentille-pellicule, pour donner des diapositives qui auront une clarté et une exactitude plus grandes que celles données par des diapositives, obtenues par une lumière en cercle.

L'usage d'une lumière en cercle pour des photographies de l'intérieur de la bouche et de cavités a certains avantages et certains inconvénients. Les avantages sont les suivants: ces lumières sont sur le marché, toutes assemblées et prêtes à être employées; la lumière et la caméra forment un tout compact, facile à transporter et à utiliser. Les inconvénients sont que la lumière en cercle ne donne pas de bons résultats pour certaines photographies difficiles à prendre. Une lumière de 360°, quand l'objet à photographier n'est pas directement accolé à un fond, jette des ombres embrouillées autour des objets à trois dimensions.

On emploie parfois un fond noir pour éliminer l'ombre autour d'un modèle; mais, certaines de ces photographies perdent de leur clarté parce que la périphérie de la dent ou de l'objet photographié se confond avec l'arrière-plan. Une lumière en cercle donne moins de contraste que les autres genres de lumière pour les espaces interproximaux, les différences de teintes des dents du mésial au distal, les détails d'une lésion ou une zone enflée. Une lumière en cercle, pour donner du contraste, doit compter entièrement sur les différences de couleurs.

Les diapositives en couleurs, quand elles sont produites avec une lumière en cercle, ne donnent pas de bons positifs en noir et blanc, parce que l'éclairage est trop mat

et ne fait pas ressortir les contrastes entre les dents et les tissus qui s'y accolent. Il est impossible, avec une lumière en cercle, d'éclairer les cuspides usés des surfaces occlusales des dents et les lésions où cet éclairage ne donnerait pas les détails nécessaires.

La petite source de lumière, quand elle est bien placée, donne un éclairage parfait de toute la cavité buccale avec le minimum d'ombre et fournit les contrastes nécessaires pour montrer tous les détails. Un petit réflecteur électronique de 3 ou 4 pouces devrait être fixé sur le côté de la caméra dans l'axe lentille-pellicule. L'endroit où est placé ce réflecteur aide à donner des diapositives en couleurs ou en noir et blanc avec le maximum de clarté et de nuances; chaque espace interproximal apparaît comme une ligne noire séparant chaque dent. Chacune des dents montre une gamme de teintes allant du

mésial au distal et une petite ombre mince entre elles. Les lésions ressortent plus pâles sur un côté et plus sombres en arrière en accusant leur forme avec un contraste et un éclat merveilleux. On peut reproduire facilement les diapositives en couleurs, qu'elles représentent des objets et des personnes en positifs noirs et blancs, si on s'est servi de cet éclairage.

Voici le genre de photographies qu'on peut réaliser avec une caméra reflex munie d'une lentille de 100 mm. et d'un charriot: (1) photographies de la figure du patient et de l'intérieur de sa bouche; (2) photographies de modèles, moules et de petits objets; (3) photographies de radiographies, de diapositives; (4) photographies de tableaux et de graphiques. L'auteur décrit la technique utilisée pour chacun de ces genres de photographies.

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case reports

Delayed eruption demands investigation

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The literature is not replete with studies to determine the incidence of supernumerary teeth, oligodontia, fused or peg-shaped teeth. The few studies that have been reported reveal conflicting opinions. Since most of the papers on the subject have been case reports, it has been difficult to

present the true problem as faced by the family dentist today.

Plaetschke (1938)¹ examined 1,000 school children and day home children in Breslau, Poland and found only 2 cases of supernumerary teeth.

Menczer (1955)² found five cases of supernumerary teeth in 2,209 children 2-6 years of age.

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FIGURE 1

Clayton (1956)³ investigated 3,557 subjects and found 79 supernumerary teeth, with 22 in the deciduous dentition. Thus, approximately 2 per cent of the subjects examined exhibited supernumerary teeth. Supernumerary teeth were also twice as common in the permanent dentition and mainly in the anterior area. The following table shows his results:

Grahnen and Granath (1961)⁴ examined 1,173 children aged 3 to 5 who were treated in the paedodontic department of the Royal Dental School, Malmö, Sweden. Supernumerary teeth occurred in 0.3 per cent of the children. The authors explain

that not all the children were examined radiographically. However, supernumer-

TABLE 1 Frequency of occurrence of supernumerary teeth in 3,557 subjects, age 3-12 and over.

Age	No. examined	Supernumerary teeth	
		No.	Per cent
3 - 5	1,795	32	1.78
6 - 8	1,292	37	2.86
9 - 11	396	9	2.27
12 and over	74	11	1.35
Total	3,557	79	1.90



FIGURE 2



FIGURE 3

ary teeth in the permanent dentition have a frequency of two to three per cent in the Swedish population.

Grahnén and Lindahl (1961)⁵ investigated 1,052 (812 men and 240 women) students at the Royal Dental School, Malmö, Sweden during a 12 year period. Supernumerary teeth were observed in 3.1 per cent of the subjects examined.

It would appear that the frequency of occurrence of supernumerary teeth ranges from 1.7 to 3.1 per cent.

The exact aetiology of this condition remains uncertain and conclusive evidence is apparently not forthcoming. Heredity and environment are, of course, prime

considerations. Apparently because of its low incidence, it has not appeared to be a pressing problem in general dental practice. However, in orthodontic practice it is indeed a problem because of the number of individuals that are referred with supernumerary teeth which require major orthodontic treatment.

CASE REPORTS

The cases here reported represent two typical examples of delayed eruption attributable to supernumerary teeth. Both patients were 8-year-old siblings.

In the first case, a boy, the diagnosis was confirmed by means of a periapical and an occlusal radiograph (Figure 1, a-c). The right maxillary deciduous central incisor and supernumerary tooth were removed. A removable acrylic splint with spurs was placed to maintain the space while the permanent central incisor erupted. Treatment was uneventful, and the patient, who never appeared in an orthodontic office, incurred little expense (Figure 2, a-f).⁶

In the second case, his sister, the condition was not diagnosed in time. A right maxillary deciduous central incisor and supernumerary tooth had previously been removed because

TABLE 2 Frequency of occurrence of supernumerary teeth in 1,052 male and female students.

Group	No. investigated	Subjects with supernumerary teeth	
		No.	Per cent
Males	812	28	3.4
Females	240	5	2.1
Total	1,052	33	3.1

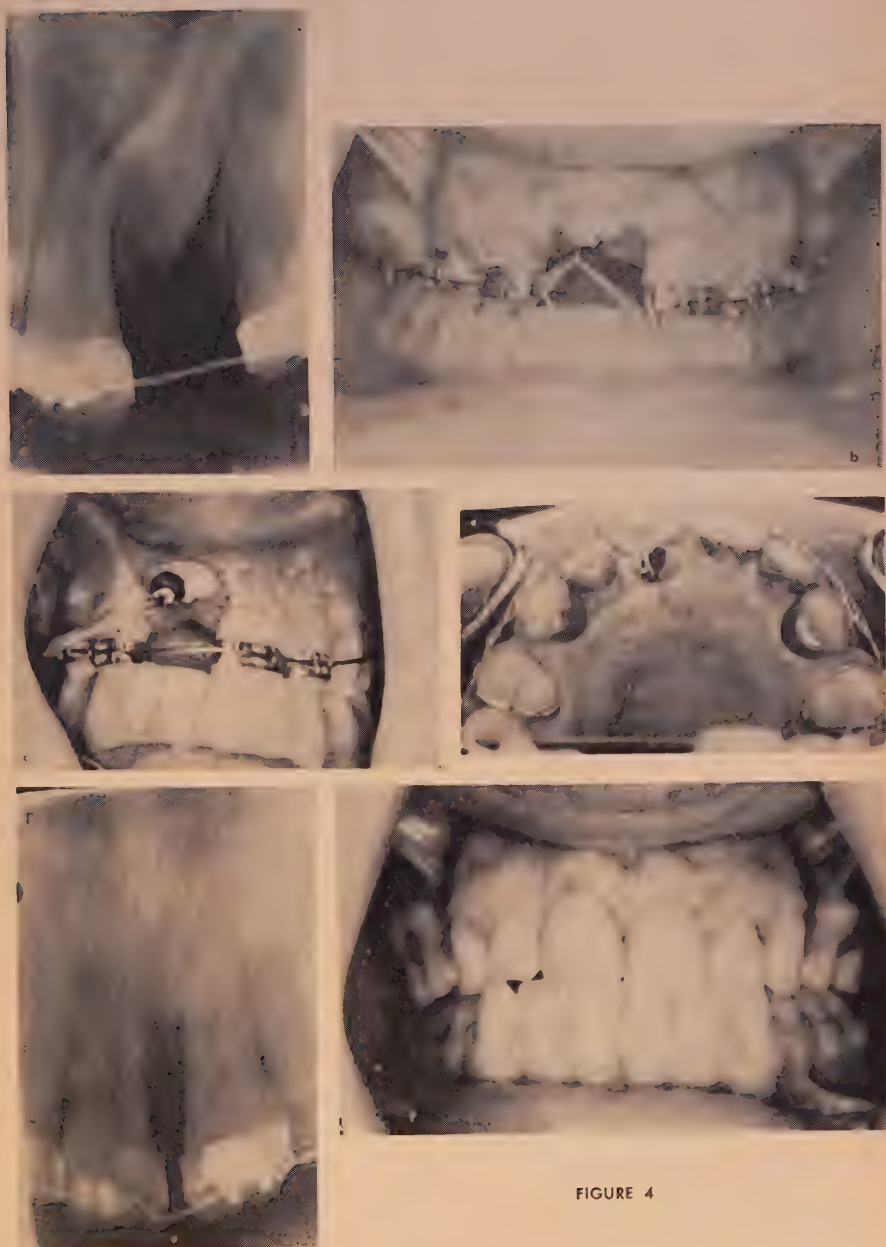


FIGURE 4

"it was staying in so long" and because "a new tooth would come in soon." The left permanent central incisor had erupted at least two years previously. Several years had elapsed and by the time she was seen by an orthodontist, the space resulting from the removal of the supernumerary tooth had closed to the degree depicted in Figure 3. It became necessary to remove the maxillary first bicuspid and institute orthodontic treatment for ten months in order to regain space for the eruption of the right permanent central incisor. The results are illustrated in Figure 4, a-f.

It so happens that this young girl could and did have orthodontic care. But her problem could have been routinely handled in the family dentist's office, as was her brother's.

SUMMARY

1. Reports in the literature indicate that the incidence of supernumerary teeth is 1.5 per cent to 2 per cent, with the majority being in the anterior region of the maxilla.

2. This problem does not always receive the attention in the dental office that it should.

3. With respect to interceptive orthodontics we may be negligent if we ignore the fact that delayed eruption demands investigation. An occlusal as well as a periapical radiograph of the anterior area of the maxilla is recommended for all children over 5 years of age.

4. There should be more research into the incidence and aetiology of supernumerary teeth and grants to support such investigations should be sought.

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abstracts

A STUDY TO DETERMINE THE EFFECT OF TOPICAL APPLICATION OF STANNOUS FLUORIDE ON DENTAL CARIES IN YOUNG ADULTS

D. H. Protheroe. R.C.D.C. Quarterly 3:20, July 1962.

The results of a study to determine the effectiveness of a 10 per cent solution of

stannous fluoride, applied topically to the teeth, as a means of reducing the incidence of dental caries in a military population of young adult males are presented.

The investigation was originally planned to be conducted in three phases of one year each. The objective of the first phase was to determine the caries attack rate for a period of one year prior to the

application of the stannous fluoride so that comparisons could be made not only between the experimental and control sides, but also with the caries experience on the same side. During the second phase the aim was to determine the effectiveness of the agent in a one-year period following its application. The objective of the third phase was to determine by re-fluoridization of one half of the group the effect of a second application one year after the first, and also to determine the effectiveness of the agent during the second year following the initial application.

Prior to the commencement of the study it had been planned to use two examiners, each of whom would perform one half of the examinations and re-examine the same subjects throughout the study. However, following the examinations at the beginning of phase one, it was felt that the findings would be more reliable if one examiner performed all the examinations but the other examiner should continue to examine one half of the subjects even though his findings would not be used, so that he could take over in case of an unexpected posting or other exigency of the service. This, of course, meant that the data gathered at the beginning of phase one could not be used, but the experience gained during this period would be useful during the remainder of the study. Furthermore, the greatest wastage of study subjects occurred during the first phase when 15 were lost compared to a total of 9 during the remainder of the study. A further alteration to the original plan was to shorten the duration of phase three for the total group from 12 to 8 months because of graduation of the senior cadets. However, the junior cadets were examined during this phase at 8 and 15 months. It is felt that neither of these changes affected the validity of the results.

The study group at the commencement of the study was comprised of 106, 17-21-year-old first- and second-year cadets enrolled at the Royal Military College, Kingston, Ontario. The stannous fluoride was applied according to Muhler's tech-

nique, but with a rubber dam in place on the experimental side. This was done to decrease the effectiveness of the agent and to reduce cross-contamination between the experimental and control sides. The experimental side of each study subject was randomly selected. All clinical procedures except the oral examination were performed by Royal Canadian Dental Corps clinical technicians.

The most significant findings were as follows:

In the first 12 months following application of the stannous fluoride there was an average reduction in the D.M.F.S. increment of 54.0 per cent which was statistically highly significant.

During an eight month period following a second application to the experimental side of the junior group only, there was an average reduction in D.M.F. surfaces of 25.7 per cent which was not significant.

The findings appear to indicate that there was a substantial reduction in caries incidence during the first twelve months following application of the stannous fluoride solution, but this reduction was somewhat less during the following eight to fifteen months, even with a second application of the solution.

This lessening of effectiveness may possibly be accounted for in part by the stannous fluoride used in the study. This was obtained in 1958 prior to the start of the study and the same supply was used throughout. It was first applied in September 1959 for phase 2, more than a year after it was received, and again in September 1960, over two years later. It has since been learned that the solubility of stannous fluoride may decrease with age, resulting in reduced effectiveness.

The findings also indicated a greater effectiveness in the posterior region of the mouth, particularly in the posterior proximal and occlusal surfaces. It is postulated that this effect could be due to the fact that adaptation of the rubber dam is more difficult on the buccal and lingual surfaces, particularly in the posterior region of the mouth.

OSTEOCLASIA AND OSTEOLYSIS

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Bone resorption occurs through osteoclastic activity under conditions of remodeling and defective matrix removal, also as a terminal phase of parathormone stimulation. On the other hand, mid-trabecular "dissolution" of bone minerals has been observed in human specimens and also in bones from rats, dogs and chicks through x-ray microradiography. A corresponding loss of density in the organic matrix has been revealed by alphasradiography of demineralized sections. The mature osteocytes are apparently related to the phenomenon (osteolysis). Organic material inside the lacunae, canaliculi and immediate vicinity, exhibits basophilia and toluidine blue metachromasia. $S^{35}O_4$, as shown by autoradiography, also appears in localized concentrations (rat). Intramuscular injections of parathormone, parathyroid hyperactivity through EDTA intravenous administration (Copp) or through the

presence of a parathyroid tumour, also the administration of norethandrolone and that of vitamin D (chick) seem to stimulate mid-trabecular osteolysis. In rachitic chicks, the effect of parathormone is enhanced by Vitamin D.

DEVELOPMENT OF THE RAT MOLAR

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It has been known for some time that tooth form can be modified by affecting the environment of the tooth germ during odontogenesis. Morphological changes experimentally produced through nutrition are sometimes related to changes in caries susceptibility, but not in a predictable manner. The mechanism by which tooth form is altered is not understood, nor indeed are the details of normal development of the rat molar.

To help remedy this gap in knowledge, reconstructions of tooth germs at various developmental stages have been made. The first models were constructed by projecting mesio-distal sections of tooth germs at various ages on plastic sheets, marking and cutting out the tooth outline, colouring to indicate hard tissue deposition, and cementing the plastic sections together. Later models have been made using tracing paper rather than plastic, and estimates of bucco-lingual width have been made by counting sections rather than by direct measurement of models. Then enamel organ including enamel matrix, and the dental papilla including dentine, were reconstructed indi-

Summaries of reports delivered at the Second Canadian Conference on Dental Research held at Banff, Alberta, October 9-11, 1962.

vidually for each tooth germ. All measurements were made on the model of the papilla, i.e. at either the future or actual dentino-enamel junction.

It was found that using the time of birth as a base-line for estimating age was not satisfactory because of the variation both in time of birth and in the exact time of fertilization. Relatively small variation in time can produce a large difference in state of development, particularly during the early and very rapid growth of the tooth germ. The latest series of models have used the time of copulation as the base from which age has been estimated.

Measurements of the models indicate that the size of the molar tooth germ is a factor of the log of age of the animal until at least 31 days post-copulation (about 9-10 days after birth). Cusp tips move apart until about the time dentine is deposited over their tips at 23 days. Dentine appears first in the distal and central cusps and later in the mesial one, and it forms a complete bridge under the base of the sulci by about 28 days post-copulation. The grooves continue to deepen until this time. Enamel deposition follows the same pattern as that for dentine, beginning about two days after dentine first appears.

STUDY OF THE GLENOID FOSSA IN ESKIMOS AND MODERN MAN IN RELATION TO FUNCTION

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The influence of genetics versus function on the flattening of the tubercle of the glenoid fossa was studied on forty Eskimos and fifty modern skulls.

A wax index was made to measure the glenoid fossa's depth, and the height of the articular tubercle.

It has been found that there is a direct

and positive correlation between these two features, regardless of racial origin.

There was no significant difference in fossa depth between Eskimos and modern skulls. However, a comparison of the height of the articular tubercle and the angle of the anterior slope of the fossa in the two groups showed a highly significant difference.

The positive correlation between the tubercle height and the wear of the dentition proved the influence of function on the growth of the eminence, if it occurred during the growth period of that region. This seems to be due to the tough nature of Eskimo food and their chewing habits.

A number of Eskimo skulls with a high articular eminence and without dental abrasion were also studied. The presence of this group in the sample suggested the lack of correlation between the flattening of the articular tubercle and racial origin.

However, to prove this fact a further study during the growth period of the skull is indicated in Eskimos and modern man.

DISPERSION HARDENING OF AMALGAMS

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The feasibility of improving the mechanical properties of dental amalgams by dispersion hardening has been investigated. The results of the present study indicate that the flow rate can be decreased as much as 400 per cent, and the compressive strength increased up to 30 per cent for amalgams prepared from standard Ag_3Sn powder mixed with various amounts of silver-copper eutectic alloy powder. The flow rate and compressive strength of the dispersion-strengthened amalgams are dependent on the particle size and amount of the dispersion powder added.

Recruitment: no time to relax

Recent experience with increased applications for enrolment at certain dental schools has prompted some members of the profession to relax their efforts at encouraging suitable students to consider dentistry as a career. Certain others have expressed concern because secondary school students in whom they took an interest failed to gain admission to a dental school. It would be regrettable if these views became widely accepted, if only because a faltering effort could quickly bring about a return to partly filled dental schools and an ominous deterioration in the nation's prospects for adequate personnel.

It is in the public interest as well as the interest of the dental profession that the best qualified individuals be accepted into our dental schools. Some competition is necessary to achieve this end but without an adequate supply of candidates this element is totally lacking.

Canadian dentistry must continue to recruit students who show promise of becoming competent practitioners. But even more important, we need keen young minds, individuals who are intellectually equipped and willing to meet the challenge of dentistry in the next quarter century. Undoubtedly, our ability to perceive and come to grips with the problem of providing adequate dental care in this growing nation will in the long run prove even more significant than technical proficiency alone.

This is the challenge that confronts us all. This is the thought that guides admission committees of our dental schools which have the task of preparing and moulding the men who must make the decisions of tomorrow. They need our continuing support if they are to discharge their responsibility in consonance with this duty. They must retain the freedom to select as potential students those who will make the most effective contribution to their country and their profession.

It is to be regretted if some desirable qualified secondary school students failed to gain admission to a dental school last year. It should be remembered, however, that it is quite impossible to mount a recruitment effort which will yield just sufficient qualified students to fill available vacancies in our dental schools—no more and no less. Moreover, the establishment of a new faculty at the University of British Columbia will soon provide new opportunities for obtaining a dental education as well as new opportunities for participation in the recruitment of students.

The failure of some students to gain admission to a dental school can be useful in another sense. Inadequately filled dental schools do not lend support to the need for expanded dental training facilities. Inability to absorb all applicants, on the other hand, can be a powerful argument when requesting government assist-

ance for additional new dental schools.

This growing nation requires more dentists and more dental schools. But, above

all, we continue to need practising dentists who will interest desirable young people in a dental career.

Second Canada-Wide Science Fair scheduled for Toronto

On May 3-4 the Second Canada-Wide Science Fair will be held at Casa Loma in Toronto. The Canadian Science Fairs Council, an organization sponsored by some thirteen scientific and educational organizations including the Canadian Dental Association, co-ordinates a program of school and regional science fairs culminating in the national event. It is perhaps significant that the national fair this year occurs in the same city as, and only two weeks preceding, the annual meeting of the Canadian Dental Association.

A science fair is an annual exhibition of high school students' scientific projects, experiments or collections. The purpose of a science fair is to show graphically the scope and magnitude of the creativeness and ingenuity of which young scientists are capable.

Science fairs may be sponsored by schools, service clubs, professional societies and other groups. Students are encouraged to prepare exhibits on some scientific subject. The winners of local contests compete for regional awards and the finalists of regional contests compete for national honours.

Of the twenty-two regional science fairs held across Canada during the last school year, twelve sent 45 finalists to the first Canada-Wide Science Fair held in Ottawa last May. At the regional fairs, 1,675 projects were exhibited and viewed by 78,000 visitors. Apart from individual entrants at regional fairs, a total of twenty-six school fairs, ranging in size from 14 to 280 exhibits, supplied participants to the regional events. In this

way, clearly hundreds of youngsters develop their capacities for enquiry and learning and at the same time increase their knowledge of the different professional fields into which their particular project has led them.

It is reasonable to assume that most dental students are drawn to dentistry during their high school years and that few choose dentistry as a career prior to entering high school. Although the science fair movement is in its infancy, in years to come it may prove to be an important factor in drawing more young qualified students to dentistry. The Canadian Dental Association recognizes this potential. That is why the Association is a sponsor of the Canadian Science Fairs Council and makes available two awards of \$100 each for winners in national competition in the dental field.

Individual dentists and local dental societies are urged to take an active interest in science fairs. As the movement spreads, they may be asked to furnish suggestions for dental health projects; they may be invited to supply judges for evaluating the exhibits.

Canadian dentists have a great responsibility in increasing public understanding and appreciation of dentistry and also in attracting more qualified entrants into the profession. Because they call for active participation both by dentists and by high school youngsters, science fairs are an excellent method of accomplishing both purposes. Dental societies and individual members of the profession would do well to become actively identified with this movement.

dentistry in the news

The Association

PROVINCIAL DENTAL SECRETARIES MEET

The third annual conference of secretaries of provincial dental organizations was held at Association headquarters in Toronto, December 3-5, 1962. Present were W. R. Upton (British Columbia), G. E. Decker (Alberta), F. R. Smith (Saskatchewan), W. G. Campbell (Manitoba), W. J. Dunn (Ontario), R. M. LeBlanc (Quebec), R. F. Samson and H. F. Bonnell (New Brunswick), G. M. Dewis (Nova Scotia), G. D. Barrett (Prince Edward Island), B. L. Bowden (Newfoundland), D. W. Gullett, Canadian Dental Association secretary, as well as other Association staff members. Attending parts of the conference were W. E. Jackson of Canadian Dental Service Plans Inc., H. N. Beach and W. F. Hancock of the National Dental Examining Board of Canada, and J. T. Staddon, administrator of C.D.A.-sponsored insurance plans.

The conference participants discussed a large number of topics including the role of the National Dental Examining Board of Canada, current provincial problems, the Canadian Dental Association headquarters staff dental prepayment plan, dental service corporations and dental prepayment plans, hospital dental services, the Canadian Fund for Dental Education, discipline procedures, presidential visitations, proposed establishment of a national dental specialists' board, and provincial governments' support for dental students.

The conference recorded its regret at the passing of the late R. A. Rooney, former secretary of the Alberta Dental Association. Dr. Rooney had been instrumental in establishing annual conferences of secretaries of provincial dental organizations.

G. M. Dewis of Halifax, Nova Scotia was named chairman of the 1963 secretaries conference. This conference will be held December 2-4, 1963, in Montreal.

C.D.A. PUBLISHES NEW "DENTAL ECONOMICS NEWSLETTER"

At its November 1962 meeting, the Dental Services Committee of the Canadian Dental Association resolved that the Bureau of Economic Research should publish a newsletter containing items of interest on "prepaid dental plans and associated matters." The first issue of the *Dental Economics Newsletter* appeared in December.

The purpose of this newsletter is to keep members of the C.D.A. Dental Services Committee and its provincial counterparts abreast of developments in the field of dental and health economics in Canada and other countries.

Many of the items published are direct quotations from articles appearing in newspapers and periodicals. They do not necessarily reflect the thoughts of the Canadian Dental Association. In fact, they may often be contrary to Association opinion and policy. They should, however, indicate thinking in this field outside of the dental profession.

As time goes on, it is hoped that more news will be available from the provincial organizations.

Canada and the Provinces

CANADIAN INSURANCE COMPANIES SHOW INTEREST IN DENTAL CARE PLANS

Several insurance companies are interested in writing dental care policies in Canada, according to the latest information available to

the Association's Bureau of Economic Research.

Continental Casualty is prepared to negotiate dental care plans, but it has not yet signed any Canadian groups. Several plans are operating in the United States, one of which is for the employees of the American Dental Association. Continental requires 100 per cent group participation and a minimum of 100 members. The company tries to design specific programs for new groups, but likes to utilize the experience gained from its American plans.

Zurich is keenly aware of the potential of dental care insurance. It is discussing and drafting a model contract. Orthodontics, full-mouth rehabilitation and crown and bridge prosthodontics are considered some of the problem areas. The intention is to base payments to dentists on the recommended fee schedule of the provincial association.

Travelers has available two plans covering dental care, but the company has not yet written any contracts in Canada.

Aetna has written a few dental care contracts in Canada. It is in the field in only a small way at present, but intends to increase its activity.

DENTISTS ON BRITISH COLUMBIA SCHOOL BOARDS

Eight dentists are now serving on boards of school trustees in British Columbia. In the December civic elections L. W. Beamish was re-elected chairman of the Burnaby school board, C. B. Jameson was elected to the board in Oak Bay and J. W. Aitken in Prince George. Completing their two-year terms as school trustees are: Walter Julien, chairman of the New Westminster school board, N. L. Crabtree of Chilliwack, W. H. Inkster of Vernon, F. A. Fergie of Cranbrook, K. A. Moore of Revelstoke.

In plebiscites held at the same time fluoridation of the water supply was passed in Fort St. John but was rejected in Delta and Revelstoke.

E. S. H. WINN BURSARY AWARDED AT U.B.C.

It has been announced by Dean Walter Gage of the University of British Columbia that the E. S. H. Winn Memorial Bursary has

been awarded this year to Richard Walter Howaniec of Vancouver, who was also the recipient of a bursary from the B. C. Dentists' Wives Association.

This bursary in the amount of \$300 annually has been established by three British Columbia dentists, R. M. D. Waddell, H. Guenther and G. D. Hall, in memory of Mr. Winn who was the former administrator of the B. C. Youth Foundation.

International Items

BRITISH GOVERNMENT APPROVES FLUORIDATION

In Britain where, according to Health Minister Enoch Powell, 67 of 137 local health authorities have already indicated support of fluoridation of the communal water supplies, the Government will give approval to add fluoride to the water supplies in an effort to reduce dental decay in children. Health Minister Powell reported that in certain localities in England, Scotland and Wales, where five-year test schemes had been carried out, there was a fifty per cent reduction in dental decay among children.

PACIFIC COAST DENTAL CONFERENCE SLATED FOR RENO, NEVADA

An invitation has been extended to Canadian dentists to attend the Twelfth Triennial Pacific Coast Dental Conference at Reno, Nevada. The meeting will be held June 17-20, 1963. Further information may be obtained from H. P. Massoth, secretary, 105 Mount Rose Street, Reno, Nevada, U.S.A.

EAST-WEST DENTAL CONFERENCE SCHEDULED FOR HAWAII

The Hilton Hawaiian Village Hotel will be the site of the East-West Dental Conference

to be held June 23-28 of this year. A cordial invitation to attend this meeting has been extended to Canadian dentists. Further information may be obtained from K. Kometani, 291 Alexander Young Building, Honolulu 13, Hawaii.

AMERICAN FUND FOR DENTAL EDUCATION OFFERS FELLOWSHIPS

Applications for the four fellowships offered by the American Fund for Dental Education to train teachers of dentistry are now being accepted at the Fund's Central Office, 410 N. Michigan Avenue, in Chicago. Applications must be received not later than March 15, 1963, to be considered for the next academic year. Application forms and explanatory material may be secured from the office of the dean of any dental school, or at the Fund for Dental Education Chicago office.

The fellowships for the academic year beginning in September 1963, provide an annual stipend of \$6,000. The applicant must be a graduate of an approved dental school in the United States or Canada, and a citizen of one of the two countries. He is required to sign a statement indicating his intention to teach at the conclusion of his graduate training. Applicants may study any school approved by the Council on Dental Education of the American Dental Association, and may specify their course of specialization.

DETROIT TO FLUORIDATE WATER

Following thorough and careful investigation into the subject of fluoridation, Mayor J. P. Cavanagh recently approved a bill passed by the common council of Detroit to fluoridate that city's water supply. After seeking expert advice, including arguments both for and against fluoridation, public hearings were held at which both sides were given opportunities to present their views. After weighing these arguments, one against the other, the council voted seven to one in favour of fluoridation.

It is estimated that fluoridation cannot be fully effected until at least 1964 at which time over 85 per cent of Michigan's residents who use public water supplies will have fluoridated water as Detroit supplies water to 52 suburban communities as well.

Dental Organizations

ALBERTA DENTAL ASSOCIATION BOARD MEETING

An increase in the per capita grant to the Canadian Dental Association, appointment of a sub-committee on dental public health to consider long-range plans for the provision of dental services in Alberta, adoption of a group sickness and accident insurance plan for members of the Alberta Dental Association, and appointment of a standing committee on insurance for dentists were among the actions taken at a recent meeting of the board of the Alberta Dental Association.

Attending the meeting were J. Zimmerman of Calgary, president-elect of the Canadian Dental Association; C. W. B. McPhail of Edmonton, director, Division of Dental Public Health, Alberta Department of Health; D. C. Deedrick of Lacombe; M. J. Lipkind of Calgary; G. V. T. Clarke of Edmonton; M. M. Woronuk of Fairview; J. Higa of Grande Prairie; R. A. Gray of Medicine Hat; C. S. Lea of Calgary; J. E. Young of Edmonton, president; and G. E. Decker, registrar-secretary-treasurer.

The board also heard reports on the addition of certain new groups to the pensioners' treatment service, progress in the establishment of a course for training dental assistants at the Northern Alberta School of Technology, possibility of establishing a similar course at the Calgary Institute of Technology, and prepayment plans for dental care.

MOUTHPIECES FOR STUDENT ATHLETES IN BRITISH COLUMBIA

One of the projects of the public relations committee of the British Columbia Dental Association has been to provide sixty mouth guards for the football players of two Vancouver high schools. The program will be enlarged if it proves successful. The mouth guards will save irreplaceable teeth and reduce the possibility of severe concussion, as the protector absorbs much of the force of a blow to the jaw, an area from which many concussions are caused.

NEW BRUNSWICK DENTISTS MEET IN BATHURST

During the past fall, the annual meeting of the New Brunswick Dental Society was held for the first time in that organization's history in the town of Bathurst. Members of the North Shore Dental Society, under the chairmanship of J. J. E. Alain, acted as hosts and organized the meeting.

The following actions were taken at the annual meeting: the annual grant to the Canadian Dental Association was increased to \$4,000; a new provincial fee schedule was approved; the value of the annual Dr. Frank Godsoe Memorial Prize tenable at Dalhousie University was increased to \$100; the society reiterated a request to the provincial government for permissive legislation so as to enable communities to hold fluoridation plebiscites; and approval was given to the holding of annual provincial licensing examinations and the issuance of interim licences.

Also approved was the new by-law relating to specialists and specialization. Six specialties are recognized: orthodontics, oral surgery, periodontics, paedodontics, dental public health and prosthodontics. Two academic years of university postgraduate training are required for specialty certification in orthodontics, oral surgery and periodontics. One academic year is required for certification in paedodontics, dental public health and prosthodontics. Restriction of practice to the specialty concerned is a prerequisite for certification in each of the specialties.

Fredericton, New Brunswick will be the site of the forthcoming Atlantic Provinces Dental Convention, July 1-3, 1963.

The following officers were elected for the year 1962-63: A. J. Coughlan of Saint John, honorary president; R. H. Dolan of Fredericton, president; Blaise Duguay of Caraquet, vice-president; H. F. Bonnell of Saint John, past president; and R. F. Sansom of Saint John, registrar-secretary-treasurer.

Named as council members were J. G. Blackmer of Saint John; D. E. Williams of Moncton; J. A. Chouinard of Edmundston; K. A. Hetherington of Fredericton; J. J. E. Alain of Bathurst; D. C. Steeves of Moncton; A. D. Bona of Saint John; R. B. DeWare of Moncton; and H. F. Bonnell of Saint John who was elected chairman of council.

J. F. Edgecombe of Saint John is a delegate to the Board of Governors of the Canadian Dental Association. G. G. Orser of Fredericton is his alternate. R. B. DeWare of Moncton was appointed delegate to the National Dental Examining Board of Canada. A. Steuermann of Saint John is his alternate. L. G. Zed of Saint John was appointed to the New Brunswick Cancer Society and H. F.

Bonnell of Saint John was named as referee on the Workmen's Compensation Board.

The committee chairmen are: A. D. Bona of Saint John, legal and hospital services; R. B. DeWare of Moncton, dental services; D. C. Steeves of Moncton, discipline and by-laws; G. L. Ramsey of Saint John, welfare; J. G. Blackmer of Saint John, public relations; D. L. Britt of Saint John, dental public health; G. A. Cormier of Moncton, provincial dental examining board; and D. C. Steeves of Moncton, recruitment.

NEW BOARD OF DIRECTORS FOR ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO

Recent elections by Ontario dentists resulted in the following Board of Directors for the Royal College of Dental Surgeons of Ontario for 1962-3; J. P. Coupland of Ottawa—District 1 (acclamation); R. C. Honey of Peterborough—District 2 (acclamation); A. B. Sutherland of Sudbury—District 3; H. M. Jolley of Toronto—District 4; W. G. Bruce of Kincardine—District 5; D. J. Ferguson of London—District 6 (acclamation); R. Michell of Kitchener—District 7; and A. H. Leckie of Hamilton—District 8. Dr. Leckie is president and Dr. Bruce vice-president of the board.

The board met in Toronto from November 19-21, 1962. Among the items discussed were: a second dental faculty for Ontario; the National Dental Examining Board of Canada; Ontario hospital insurance benefits for certain dental admissions; hospital internship; regulations for hospital dental services; revision of by-laws respecting dental hygienists; required academic standards for admission to courses in dental hygiene; estate problems following the death of a practitioner; establishment of a dental service corporation for the administration of prepaid plans for dental care; extension of existing Ontario dental welfare plans; pension plans for dental auxiliaries; Department of Veterans Affairs fee schedule; insurance plans for the dental profession; dental laboratory prescriptions; temporary registration; and specialty certification.

A. C. Lewis, former dean of the Ontario College of Education and now consultant in education to the Council on Education of the Canadian Dental Association, recently made a study to determine the most appropriate location for a second dental school in Ontario. The board concurred with Dr. Lewis' recommendation that a new school be located at McMaster University in Hamilton, provided that a medical school be estab-

lished there simultaneously. The University of Western Ontario was named as a second choice in the event that conditions as outlined for McMaster University cannot be fulfilled. Further discussions are to be held with the provincial Departments of Education and Health.

It was learned that the Hospital Claims' Division of the Ontario Hospital Services Commission will continue to provide entitlement for hospitalization to patients admitted for dental treatment whenever there is any medical necessity. In addition, the Commission recognizes that behavioural problems with young children may require hospital admission.

The board adopted a strong resolution which urged the Council on Education of the Canadian Dental Association, in its establishment of minimum requirements for the approval of a course in dental hygiene, to stipulate the possession of a senior matriculation qualification as an admission requirement.

The board also approved the incorporation of an agency to operate prepayment plans for dental care in Ontario. The creation of a non-profit dental service corporation would then meet the requirements of the Prepaid Hospital and Medical Services' Act of Ontario. Such an agency may, if it wishes, retain the accounting services of Canadian Dental Service Plans Incorporated. However, the law requires the dental service corporation to be the contractual party in respect of any non-profit prepayment plans which may be developed.

Following a meeting with the Minister and Deputy Minister of Public Welfare in July, 1962, it appears likely that an augmentation of beneficiaries under the Mothers' and Dependent Children's Allowances Act will eventuate, but there appears to be little hope of extending the existing dental welfare plan to older age groups at present.

The Department of Veterans Affairs recently proposed to the Canadian Dental Association certain administrative changes respecting payment of dental accounts. The department offered to accept as a basis of payment fee schedules which had been approved by the respective provinces, less ten per cent as an administrative expense. As the board strongly favours the applicability of provincial fee schedules recognized by the profession, it expressed the view to the Canadian Dental Association that it favoured recognition of provincial fee schedules by the Department of Veterans Affairs. The board also agreed that the Canadian Dental Association continue its negotiations with the Department of Veterans Affairs on a basis that provincial fee schedules as established by the profession, less ten per cent, be accepted as a scale of payment for services be-

tween the department and the dentist rendering the services.

The board also considered the matter of making temporary registration for dentists possible. In view of the experiences of other licensing authorities and the fact that temporary registration creates more problems than it solves, this measure was not approved.

The board extended sincere appreciation to M. V. J. Keenan of Sudbury who recently tendered his resignation after completing his sixth term as a member of the board. Dr. Keenan is president of the Canadian Dental Association.

MONTREAL ALPHA OMEGA DENTISTS REPORT ACTIVITIES

Two founding members of the Montreal Alumni Chapter, Alpha Omega Fraternity, M. Goldenberg and H. H. Pearson were honoured with life memberships at the group's opening meeting in September 1962 in recognition of their contributions to dentistry, to their community and to Alpha Omega Fraternity.

A noted New York prosthodontist, S. Silverman was the clinician at an all-day meeting held at the University of Montreal early in October. Dr. Silverman reviewed impression techniques for complete upper and lower dentures, immediate denture service, registration of centric and vertical records and the selection of artificial teeth in prosthodontic procedures.

ORAL SURGERY AND ORTHODONTICS FEATURED AT MOUNT ROYAL DENTAL SOCIETY MEETING

Two members of the Mount Royal Dental Society, H. L. Levitt and Mervyn Gornitsky addressed the society's third meeting of the current season on December 11, 1962. Inter-related problems of orthodontics and oral surgery formed the subject of their presentation.

Dr. Levitt discussed the procedure of serial extraction to relieve overcrowding and over-lapping where there is an insufficiency of bone for the entire dentition and where the eventual removal of bicuspids is inevitable.



Honorary memberships were conferred recently on ten members of the Montreal Dental Club, each with a minimum of thirty-five years of continuous dental practice. The recipients are (l. to r.) C. R. Seller, R. E. McMahon, N. L. Martin, F. A. Edward, J. A. Carney, L. S. Burton, R. E. Dagg and J. R. Carson. Not present for this photograph were K. C. Berwick and E. C. Burbank.

Dr. Gornitsky described labial and lingual abnormalities of the fraenum. He suggested that tongue training is often necessary to correct malpositions of the tongue following lingual fraenectomy.

The speakers also discussed the management of impacted third molars and cuspids and the treatment of ankylosed second deciduous molars.

MONTREAL DENTAL CLUB HONOURS TEN MEMBERS

Ten members, each with thirty-five years in the practice of dentistry, received honorary memberships in the Montreal Dental Club at the Annual Black Tie Dinner held on December 10, 1962. Recognized were: K. C. Berwick, E. C. Burbank, L. S. Burton, J. A. Carney, J. R. Carson, R. E. Dagg, F. A. Edward, R. E. McMahon, N. L. Martin and C. R. Seller.

At the same meeting E. A. Collard of the *Montreal Gazette* addressed the members about interesting incidents in Montreal's history.

Canadian Dental Schools

UNIVERSITY OF BRITISH COLUMBIA

First Dental Classes in 1964.—The Faculty of Dentistry of the University of British Columbia will reportedly commence its first classes in September 1964. S. Wah Leung, newly appointed dean of the faculty does not foresee any difficulty in building the faculty up from twelve students to be registered in the first year to a maximum of forty in later years. He believes this will supply sufficient dentists to fill the needs of the province. At present there is only one dentist to every 2,400 of population and he feels there should be one for each 1,800.

The course will occupy a period of seven years—three in arts and four for professional training. Dr. Leung hopes to set up courses for students who wish to specialize and also eventually train dental assistants and hygienists.

President Macdonald Honoured in Scholarship.—Two scholarships worth a total of \$2,000 have been set up by the B'Nai B'Rith

Hillel Foundation at the University of British Columbia to honour President John B. Macdonald and Dr. N. A. M. MacKenzie, his predecessor. The one in Dr. Macdonald's name will help a student in the University of British Columbia's faculty of dentistry, and the other will assist an Israeli student to complete high school training.

UNIVERSITY OF ALBERTA

First Dental Hygienists Graduate.—Nineteen graduate dental hygienists received their diplomas at the University of Alberta School of Dental Hygiene on October 16, 1962. They are the first dental hygienists to graduate from Alberta's dental faculty.

The dental hygiene training program at the University of Alberta was instituted through subsidization by the provincial government and in co-operation with the Faculty of Dentistry.

H. W. Reid, a member of the Council on Education of the Canadian Dental Association, addressed the graduating class. The graduates will be initially employed by health units in the province.

UNIVERSITY OF TORONTO

Executive of Dental Alumni Association.—A recent election of officers of the University of Toronto Dental Alumni Association resulted in the following executive: A. J. Tait of Rexdale, president; J. D. Simpson of Thornhill, president-elect; W. L. Heaslip of Toronto, secretary; and A. D. Smith of Scarborough, treasurer.

DALHOUSIE UNIVERSITY

New Oral Surgery Appointment.—The appointment was recently announced of F. W. Lovely, as assistant professor of Oral Surgery in the Faculty of Dentistry, Dalhousie University.

A native of East Florenceville, New Brunswick, Dr. Lovely received his pre-dental training at Mount Allison University and his undergraduate dental training at Dalhousie

University. He graduated from the latter university in 1959.

Dr. Lovely was subsequently employed with the Royal Canadian Dental Corps as an oral surgeon on the staff of the Canadian Forces Hospital, Halifax. He received a fellowship in dental surgery from the Royal College of Surgeons, London, England, in 1961.

Royal Canadian Dental Corps

NEW SENIOR APPOINTMENT

National Defence Headquarters recently announced the appointment of Col. J. F. Edgecombe, O.B.E., E.D., C.D., D.D.S., F.I.C.D. as Colonel Commandant of the Royal Canadian Dental Corps. Col. Edgecombe has served as Honorary Colonel Commandant of the Corps since January 1960 and the new designation of the appointment is in accordance with current Dept. of National Defence policy.

TOPICAL FLUORIDE APPLICATIONS FOR RECRUITS

Topical applications for all suitable recruits and cadets of the Canadian Armed Forces with an eight per cent solution of stannous fluoride has recently been undertaken by the Corps. It is felt that the value of this treatment in reducing dental caries in young adults is sufficiently well documented to warrant as wide coverage as possible and its use will be increased as the availability of dental officers and clinical dental technicians permits.

TOASTMASTER CLUB FORMED AT R.C.D.C. SCHOOL

In order to develop facility in public speaking among the students and staff of the

R.C.D.C. School, Camp Borden, a local chapter of Toastmasters meets daily during the noon hour. Indications to date reflect enthusiastic participation and excellent progress.

LT.-COL. COVEY ATTENDS SPECIAL COURSE AT NATIONAL DEFENCE COLLEGE

Lt.-Col. G. R. Covey of the Directorate Staff was the only dentist attending the Health Operations and Administration Course conducted by the Emergency Health Services at the Civil Defence College, Arnprior from December 10-14. This course was designed for civilian medical personnel appointed to regional, zone, municipal or target area headquarters positions and outlined current and proposed measures to be instituted at these levels in case of any national catastrophe.

POSTINGS

Major C. Brown has received a posting to Headquarters, Manitoba Area, Winnipeg following his recent tour with No. 4 Field Dental Company in Germany.

Captain J. M. L. Rochefort, a graduate of the University of Montreal, is beginning his career in the Corps at the Canadian Joint Air Training Centre at Rivers, Manitoba.

Public Health

SENATE EXCHANGE REVEALS FEDERAL GOVERNMENT'S ATTITUDE ON FLUORIDATION

The *Journal of the Canadian Dental Association* is indebted to Senator Donald Smith for the following text of an exchange of questions and answers on fluoridation which occurred in the Senate on November 28, 1962. The answer given by Senator A. J. Brooks

may be taken as indicative of the federal government's attitude on fluoridation.

Hon. Donald Smith inquired of the Government, pursuant to notice:

1. What year did communities in Canada and the United States commence the addition of fluorides to their water supply for the prevention of dental disease and what are the names of these communities?

2. With respect to such communities in Canada,

- (a) Is fluoridation continuing?
- (b) What steps have been taken to observe the effects of artificial fluoridation?
- (c) Were comparisons made with other communities using a water supply of low and of high natural fluoride content?
- (d) Did the Federal Department of National Health and Welfare participate in these observations?
- (e) What were the results of such observations with respect to, (i) dental health, (ii) general health?

3. What is (a) the maximum permissible level for fluorides added to water supplies?

- (b) the level established in water supplies presently fluoridated in Canada?
- (c) highest and lowest known level in naturally fluoridated municipal water supplies in Canada, and where do these levels exist?

4. What is the estimated annual cost per capita of fluoridation of municipal water supplies?

5. At the present time is there an equally effective practical alternative to the fluoridation of municipal water supplies?

6. How many municipalities in Canada and the United States are presently fluoridating the water supplies and what is the estimated total population involved?

7. Have the health authorities of any of those municipalities reported any ill effects from fluoridation?

8. In Canada, what provincial and national associations of the dental and medical profession have recommended fluoridation?

Hon. A. J. Brooks: The answer to the honourable gentleman's inquiry is as follows:

1. One community in Canada, Brantford, Ontario, and two in the United States, Newburgh, N.Y. and Grand Rapids, Michigan began to add fluoride to their water supplies in 1945.

2. (a) Brantford continues to fluoridate.

(b) Two independent dental studies have been made of the dental conditions of Brantford children; one by the Brantford School Dental Officer and one by National Health and Welfare.

The health authorities and the medical profession at Brantford have kept the population under close scrutiny.

(c) Comparisons were made among the child population of Brantford and that of Stratford where the water is naturally fluoridated, and that of Sarnia where the fluoride content of the water is negligible.

(d) The Department of National Health and Welfare organized and directed the study in which the dental conditions of the child populations of Brantford, Sarnia and Stratford were compared.

(e) (i) The statistical findings indicate that about one (1) part per million of fluoride in a water supply either added mechanically or de-



Dr. Guy Boisclair (arrow), of the Dental Hygiene League of the Province of Quebec signs the Golden Book at a ceremony commemorating the start of fluoridation in the city of Trois Rivières. Also present were (seated, l. to r.) Leo Thibault, alderman; Dr. Gabriel Lord, president of the League; Mayor J. A. Mongrain; Dr. Guy Boisclair; Dr. Ephrem Vinet, secretary-treasurer of the League; and Dr. Roméo Beaudry; (standing, l. to r.) Dr. Roger Baribeau; Dr. Marcel Lafrenière; M. Giguère, alderman; Dr. Vincent Donfigny, president of the St. Maurice District Dental Society; M. Dumas and M. Deschênes, aldermen; Dr. Marius Crête, governor of the College of Dental Surgeons of the Province of Quebec; Dr. Pierre Rinfret, vice-president of the St. Maurice District Dental Society; and M. Charland and M. Lepine, aldermen.

rived from a natural source reduces the prevalence of tooth decay among those consuming it from birth by about two-thirds.

(ii) The health authorities of Brantford and of Stratford report no medical ill-effects from the water-borne fluoride in either place.

3. (a) The permissible level of fluoride in a water supply is determined by the province concerned. One (1) to one decimal five (1.5) parts per million is regarded as a suitable range.

(b) The level in common use in Canada is about one (1) part per million.

(c) Fluoride analyses have not been made for all community water supplies. Known fluoride levels range from insignificant traces to four decimal eight (4.8) parts per million. Levels from two (2) to four (4) parts per million are known to occur in Alberta, Manitoba, Ontario and Newfoundland.

4. The annual per capita cost of fluoridation ranges from 3.8 cents upwards to about 10 cents depending on the kind of fluoride compound used and shipping costs. The average is probably below 10 cents per capita.

5. There is no equally effective and practical alternative.

6. The most recent reports show ninety-nine (99) Canadian communities fluoridating. The total Canadian population involved is 1,780,354.

In the United States two thousand two hundred (2,200) communities are reported as fluoridating. The total American population involved is about forty-two million (42,000,000).

7. No ill-effects from fluoridation have been reported by the health authorities of any of the municipalities fluoridating.

8. All ten provincial Dental Associations, the Canadian Dental Association, the Canadian Medical Association and the Canadian Public Health Association have approved fluoridation.

FLUORIDATION CEREMONY IN TROIS RIVIERES, QUEBEC

Trois Rivières and St. Maurice District dentists and city dignitaries recently witnessed a ceremony commemorating the start of fluoridation in the city of Trois Rivières when representatives of the Dental Hygiene League of the Province of Quebec and the College of Dental Surgeons of the Province of Quebec awarded city council a certificate of acknowledgment to mark this important event.

Trois Rivières is the first community of more than 50,000 people and the twentieth community in the province of Quebec to adopt this health measure. Quebec occupies second place in a ranking of provinces according to the number of communities fluoridating their water.

TORONTO VOTERS APPROVE FLUORIDATION

Sixteen municipalities in Ontario held fluoridation plebiscites in December, 1962. Five of these were successful and eleven failed to pass. According to Ontario law, the results of these plebiscites are binding

and the water must be fluoridated in those communities which voted in favour.

Metropolitan Toronto, believed to be the largest municipality ever to approve fluoridation by public vote, will start to fluoridate its water supply in May 1963. Toronto, along with Windsor, Amherstburg, Prescott, and Welland, who also voted in favour will double the number of persons now using fluoridated municipal water in Canada.

correspondence

The Journal devotes this section to comments by readers on topics of current interest to dentistry. The editor reserves the right to edit all communications to fit available space and requires that all letters be signed. Printed communications do not necessarily reflect the opinion or official policy of the Canadian Dental Association. Your participation in this section is invited.

PIGMENTATION OF TEETH BY TETRACYCLINE

To the Editor:

I was pleased indeed to note in the November 1962 issue of the Journal an abstract of the paper, "Discolouration of teeth pos-

sibly due to administration of tetracyclines: a preliminary report."

However, in my opinion perhaps of even greater significance in this area of concern is the paper by Wallman, I.S. and Hilton, H.B., entitled "Teeth pigmented by tetracycline" published in the *Lancet* 1:827, April 21, 1962.

You will also note that I am forwarding a copy of this letter to Dr. K. J. Paynter, chairman of the Council on Research, with the request that he kindly inform us as to whether that council has under consideration the preparation and issuance of a statement in this regard which in my opinion would indeed be most timely.

F. McCombie, L.D.S., R.C.S., D.D.P.H.,
Director,
Division of Preventive Dentistry,
B. C. Health Branch,
Victoria, B.C.

Transactions of the Canadian Dental Association • The Association's *Transactions* contain reports of the activities of the various bureaux, councils and committees. Published in English and in French after every meeting of the Board of Governors, it is recommended reading for all Canadian dentists.

book reviews

GRADUATE AND POSTGRADUATE PERIODONTOLOGY, 2

P. A. Ratcliff, ed. *Proceedings of a workshop conducted by the American Academy of Periodontology for teachers in periodontology at the University of Minnesota, Minneapolis, June 23-25, 1960. Fullerton, California, Premier Printing Company, 1962. 107 p.*

This text should prove of considerable interest and value to all those interested in graduate or postgraduate study—whether from the point of view of the student, teacher or one interested in research.

With almost one hundred and twenty-five teachers taking part in the workshop, it is not surprising that there is never complete unanimity of opinion. What is surprising, however, is that there is so much general agreement. With regard to the length of courses, it was generally agreed that post-graduate courses should last eighteen months, while the graduate student should require two additional months. Both courses are basically the same, but two important differences seem to stand out: first, the hours allotted to clinical experience in periodontics for the graduate student should be somewhat reduced; and second, the graduate student should require considerably more time for study in the basic sciences, research and the preparation of a thesis in connection with the latter.

It was admirably stressed, however, that in both courses the student should be made to realize that the periods of study are but "continuing education." He should be made fully aware that the best methods of treatment have not yet been discovered, and that the latest information derived from research is not yet available.

One of the main problems to be encountered at the moment is the obvious lack of qualified teachers—teachers with periodontal practice experience, teaching experience and with considerable knowledge of research. Only time can rectify these problems.

The fact that this book reports a study made by those interested in periodontics

should not detract from the fact that many of the observations made are certainly applicable to any phase of dentistry. Viewed in this light, it should make a worthy contribution to dentistry in general.

R. F. Harvey

PRINCIPLES AND TECHNIQUE OF EXODONTIA

C. E. Rounds. Ed. 2. St. Louis, Mosby, 1962. 388 p. Illus. \$12.50

This book is, as the name implies, strictly a basic text on the extraction of teeth and some minor complications that may occur during their removal. It could hardly be termed a reference book, as the field covered is much too limited.

There is a very good chapter on the historical background of early dentistry. The author follows this with a basic review of anatomical landmarks which is very well covered. There follows a chapter on instruments with illustrations, and an excellent description of the sharpening of various instruments together with their sterilization.

The manipulation of forceps for the extraction of maxillary and mandibular teeth is described with illustrations and there is a good chapter on the dentist's function while treating a patient under general anaesthesia. Such things as the maintenance of a free airway, the importance of a properly placed throat pack and aspiration are well covered, without any attempt being made to describe the anaesthesia itself.

Accidents of a minor nature are reasonably well covered and the basic causes of excessive haemorrhage are described without much practical information on prevention and treatment.

There is a comprehensive section on impacted teeth with a heavy accent on the techniques of the late George Winter. While it is to be admitted that Dr. Winter was a pioneer in the field of exodontia, the heavy

"exolevers" (heavy elevators with a "T" type handle) have long since been gathering rust in the bottom drawer of the cabinet of most exodontists today. The only modern touch is a brief mention of the use of high-speed equipment along with chisels for the removal of bone and sectioning teeth.

To sum up, this is a very basic text on the removal of teeth for students and general practitioners. In the opinion of this reviewer this book needs much modernizing. There is no mention of the use of antibiotics in exodontia, nothing on cysts or tumours, and most of the illustrations in the book are from Dr. Winter's text, published in 1913.

D. H. MacDonald

OCCCLUSION IN PROSTHODONTICS AND IN THE NATURAL DENTITION

M. M. Silverman. Washington (3315 Wisconsin Ave., N.W.), Mutual Publishing Co., 1962. 308 p. Illus. \$16.50

The correct estimation of the vertical dimension and the interocclusal rest space (free-way space) has long been the Achilles heel in maxillo-mandibular relationship. Silverman offers a new approach to this important subject in a book of 308 pages with 263 illustrations.

The author demonstrates very convincingly that by the use of the sibilant sounds an accurate measurement may be made of the space created between centric occlusion and the rest space during function (the closest speaking space). Studies by several investigators have proven that the freeway space can not be constantly reproduced. Silverman not only reproduces the closest speaking space but has a system of recording it permanently.

The chief flaw appears to be that though the permanent records may be made with immediate dentures, there is much less accuracy when the edentulous patient presents himself. However, by use of the suggested phonetics it is much easier to determine the position of the anterior teeth than previously when only the dentist's sense of aesthetics was the guide.

Another flaw seems to be that the standard procedure of balancing dentures can not be carried out in cases where the vertical overlap is considerable. To offset this, Silverman uses a Coble Balancer in the mouth to grind in the eccentric excursion of the mandible.

He also uses the Coble Balancer to obtain centric occlusion relationship, employing the tapping method. In the opinion of this re-

viewer it would be better if he used the same instrument to obtain a Gothic Arch tracing.

An adjustable articulator is not required in Silverman's system, the only condition being that the articulator has an adjustable anterior pin. Thus, a face bow and eccentric registrations are not employed.

Though some of the subjects are dealt with in a manner which would be open to controversy by some students of mandibular movements, the portion dealing with phonetics and vertical dimension appear to be accurate and are treated in a fascinating and original manner. The author gets his main points across simply and well.

This reviewer has no hesitation in recommending this book to the general dentist.

C. H. Moses

PRINCIPLES OF PUBLIC HEALTH

J. M. Dunning. Cambridge, Harvard University Press, 1962. (Available from S. J. R. Saunders & Co. Ltd., Toronto). 542 p. Illus. \$12.10

In this text the reader will find an introduction to the broad field of public health representing an invaluable guide to the graduate dentist who may be confronted with the need to establish and administer a dental public health program.

The practising dentist is shown that he must understand and employ much more than the concepts of clinical dentistry alone if he is to assume responsibility for a community dental health program.

A study of this publication will afford the reader an elementary knowledge of those specific tools of public health which are a prerequisite to the establishment of any well founded public health program.

In the beginning, the background of public health is applied to dentistry. Then follows a presentation of the basic concepts of biostatistics and epidemiology that enable a dentist to organize and evaluate his public health program. Administrative principles together with a fairly searching concept of an administrator are also discussed.

Dr. Dunning deals with preventive measures for caries, periodontal disease and malocclusion while stimulating the reader to be alert and so discover pathological processes in their incipient stages.

The discussion about the health educator and the value of the various behavioural scientists proved to be most stimulating. Even

the experienced public health administrator will find stimulus in these particular pages.

Dr. Dunning also describes those elementary principles which are necessary to inaugurate dental health programs within schools and industry. He outlines a methodology for determining the dental needs of a community. Some of the various payment plans available to the public health worker are discussed, thereby enabling him to follow through with the remedial measures which may be necessary for the successful conduct of his dental care program.

The present together with some of the future potentialities of the dental auxiliary are expounded in a manner which will encourage the public health worker to accept and utilize the valuable contributions made possible by the wise deployment of this worker.

The *modus operandi* of state, national and some international programs give the foreign reader a concept of the various administrative levels of dental public health in the United States of America together with a bird's eye-view of dental activities within the World Health Organization.

Following a critical study of this text, this reviewer was impressed by the valuable public health concepts contained within its pages. This publication would prove valuable reading for both the student and the graduate dentist. Its careful perusal will arm the reader with a basic concept of the broad field of dental public health and should stimulate additional reading from the valuable reference material that the author has included at the conclusion of this excellent text.

H. S. Grey

THE WORLD'S WORST TEETH

Edward Samson. London, Staples Press, 1962. 152 p. 12s. 6d.

Most dental books possess at least some of the many possible qualities that make a publication worth reading. This little volume possesses all of them. As a dental writer, author Edward Samson's competence is outstanding; in fact he is obviously capable of contributing handsomely to the field of general literature. The writer's refreshing and smooth flowing style are, however, merely dividends that add colour and meaning to a theme that in spite of its importance, could be very dry.

The subject is dental health, but specifically dental health as related to the Dental

Service of the National Health Service that came into being in England in 1948. Basically the premise of all social plans is to bring the greatest good to the greatest number — an ideal that cannot be challenged. Unfortunately, when these purest purposes are related by the social reformers to the existing dental personnel available to implement their beneficent wishes, deep rooted obstacles bar the probability of achieving complete success. As Edward Samson says, "Human ailments and needs do not always fit comfortably into plans." Eventually by bending and stretching, more people receive some dental treatment and in the administrators' records this denotes success.

Meanwhile the dental profession knows the abject futility of treatment without an accompanying appreciation of dental health. Of this the author states, "So it is that National Health Service dentistry supplies the demands, if not the needs, of a dentally ignorant public, and will continue to repair and replace neglected teeth at enormous cost to public funds, giving everything equal to all with never a thought for the best, preventive dentistry rendered desirable by education." Contrary to these realities, the Dental Service as conducted in terms of expenditure and return is a success according to those who made the rules.

By proclamation, entreaties, and common sense, every health official recognizes that prevention would effect a maximum saving in taxpayers' money and co-incidentally improve dental health. Public insistence and appreciation developed through education could accomplish this end. But how do you develop public appreciation in a country where dental disease even in its terminal stages is considered to be a hallmark of cultural achievement?

Undoubtedly the standards envisaged by politicians, administrators and the public fall far short of those aspired to by dentistry.

Edward Samson thinks that these many husky adversaries to fruitful dental health can be vanquished. Somehow he retains a flicker of optimism for the dental health of the people of England which he claims, and this reviewer thinks correctly, is not unlike that of North Americans. If we know what message we wish to give the public and how to give it, the author feels there may be hope. "The government must be made to undertake this education for which it alone can find sufficient funds, personnel and the requisite organizations. It must, and this is the hardest task, be ready to realize that a National Health Service which omits provision to reduce the incidence and effects of dental disease is at least in relation to its Dental Service, what Lewis and Maude have

said of the whole, 'a gigantic confidence trick'."

It is inadequate to say that this book would be a worthwhile addition to our libraries, for everyone even remotely concerned with dentistry should read it deliberately. Dental health problems within a welfare plan, outside a welfare plan, or on the brink of one

are the same the world over. If the public can be made to appreciate dental health, dental health will improve.

Edward Samson's intelligent suggestions and observations could be a help not only in England but everywhere.

E. R. Bilkey

additions to the library

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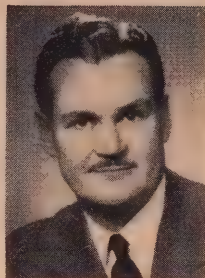
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conventions



A. D. Kelly



W. G. McIntosh



I. W. Outerbridge

Canadian and Ontario Dental Association

joint convention in Toronto May 19-22, 1963

The national convention of the Canadian Dental Association and the annual convention of the Ontario Dental Association will be a joint event held at the Royal York Hotel, Toronto beginning Sunday, May 19 and continuing through Wednesday, May 22, 1963.

The annual meeting of the Board of Governors of the Canadian Dental Association will be held at the Royal York Hotel, Toronto beginning at 9.30 A.M. on Wednesday, May 15 and continuing through Saturday, May 18, 1963. The meeting is open to all members of the Association who are urged to attend and participate in the deliberations.

The scientific program, embracing lectures, group clinics, projected clinics, demonstrations by closed circuit television, table clinics, scientific motion pictures, scientific and commercial exhibits, also contains a number of features of exceptional interest.

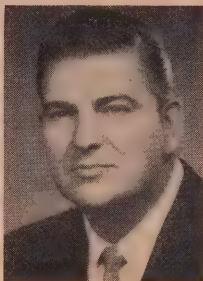
This year's C.D.A. panel presentation, "The changing pattern of health services within the framework of the body politic" will be an outstanding event which should attract a large audience. The three panelists are Dr. A. D. Kelly, general secretary of the Canadian Medical Association, Dr. W. G. McIntosh, a past president of the Canadian Dental Association and current chairman of the Association's Dental Services Committee, and Mr. I. W. Outerbridge, a prominent Toronto lawyer who has had considerable experience in the medico-legal field.

A prominent Swedish dentist, Ulf Posselt of the Royal Dental School, Malmö will present essays on the management of bruxism and clinics on occlusal rehabilitation. J. H. Mosteller of Mobile, Alabama will present essays on class V restorations and clinics on cavity preparations for silver amalgam and on silicate cements in class III cavities. Other clinicians include R. H. Boos of Minneapolis on complete prosthodontics; H. M. Rode of Philadelphia on partial prosthodontics; R. H. Skurnik of Montreal and C. D.

Torneck of Toronto on endodontics; R. H. Bingham of Halifax on oral diagnosis; L. E. Francis of Montreal on pharmacology; Lt.-Col. J. S. Turner of Camp Borden, Ontario on crown and bridge prosthodontics; H. M. Worth of Victoria on radiology; and W. H. Feasby of Winnipeg on paedodontics. The Dental Public Health Committee of the Ontario Dental Association will sponsor an orthodontic presentation from the Burlington (Ontario) Orthodontic Research Centre.



Ulf Posselt



J. H. Mosteller

Canadian Dental Association sections on dentistry for children (Canadian Society of Dentistry for Children), oral surgery (Canadian Society of Oral Surgeons), orthodontics (Canadian Society of Orthodontists), and periodontics (Canadian Academy of Periodontology) will also present scientific programs between May 18-22, 1963.

This year's Art and Flower Exhibit is again expected to draw a large number of entries. Dentists, members of their immediate families and their employees are invited to submit flower displays, oil paintings, sketches, pastels, sculpture, ceramics, pottery, shell craft, leathercraft, woodwork, miniature castings, photographic enlargements, transparencies or any other handiwork in the art and crafts for display at the Art and Flower Exhibit of the forthcoming convention. Additional information may be obtained from J. G. Dale, Canadian Dental Association headquarters, 234 St. George Street, Toronto 5, Ontario.

A theatre party, class reunions and the President's Ball are included in convention social events. A special program has also been planned for the ladies.

Reduced rail fare certificates are available at Association headquarters.

Canadian Society of Oral Surgeons annual scientific meeting in Toronto May 20-21, 1963

The annual scientific meeting of the Canadian Society of Oral Surgeons will be held at the Royal York Hotel, Toronto, May 20-21, 1963, in association with the national convention of the Canadian Dental Association. All members of the Canadian Dental Association are cordially invited to attend the clinical sessions.

Monday, May 20, 1963

8.30 A.M. General meeting

9.30 A.M. J. E. ANDERSON, Toronto: Anatomy of the head and neck

12.30 P.M. Canadian Dental Association Luncheon

3.00 P.M. A. E. HOFFMAN, Halifax: (Topic to be announced)

Tuesday, May 21, 1963

9.00 A.M. H. SHANOFF, Toronto: Medicine—complications related to dentistry

10.45 A.M. Four 15-minute presentations on oral surgery

12.30 P.M. Luncheon

2.00 P.M. A. A. ANTONI, Toronto: Surgical correction of jaw deformities

3.30 P.M. Business Meeting

in memoriam

J. WALLACE GRAHAM—Dentists throughout Canada will be saddened to learn of the untimely death of Dr. J. Wallace Graham. He was president of the Toronto Academy of Medicine at the time of his death. Physician, dentist, teacher, and one of the world's foremost authorities on arthritis, Dr. Graham died suddenly in Toronto on December 14, 1962 at the age of 56. Born in Sudbury in 1906, Dr. Graham was educated in Madoc and Markham, Ontario. He proceeded to the University of Toronto where he graduated from the Faculty of Dentistry in 1928 and from the Faculty of Medicine in 1933. Through further study Dr. Graham earned the degrees M.R.C.P. (London) in 1937, F.R.C.P. [C] in 1946 and F.R.C.P. (London) in 1956.

Dr. Graham developed an early interest in arthritis. He was skeptical about the theory of focal infection as an alleged cause of this disabling disease and did much to correct this notion.

In 1941 he joined the Royal Canadian Naval Volunteer Reserve where he rose to the rank of surgeon-commander and consultant in medicine. When arthritis among the armed services proved to be one of the major illness problems of the Second World War, Dr. Graham, as the most experienced physician for the task, was chosen to establish the first treatment centre for all the services' rheumatic and arthritis victims at the Ontario Hospital, St. Thomas.

In 1945 Dr. Graham was appointed lecturer in the Faculty of Dentistry, and he represented Toronto's medical faculty on

the Council of the Faculty of Dentistry. Further teaching appointments and promotions in both faculties resulted in his attaining the rank of associate professor of Medicine in both faculties.

As director of the University of Toronto's rheumatic disease unit, Dr. Graham was most immediately concerned with the intensive treatment of victims of this disease. But he placed equal emphasis on the need for basic research into medical problems. He was instrumental in establishing a national body of medical specialists, the Canadian Rheumatism Association of which he was the first president in 1947. The following year he was instrumental in founding a national voluntary agency, the Canadian Arthritis and Rheumatism Society to rally lay support in the battle against these disabling diseases. Dr. Graham served as the Society's founder and president in 1948-9, and remained as chairman of its medical advisory board.

Dr. Graham's leadership in medicine was acknowledged on an international scale. On various occasions he was a visiting professor to Roumania, the U.S.S.R., Czechoslovakia, and international congresses at Istanbul, Rome, Stockholm and Latin America.

In 1957 he was instrumental in bringing the Ninth International Congress on Rheumatic Diseases to Toronto. Dr. Graham served as vice-president of the congress which was attended by 1,200 scientists from forty-four different countries.

Dr. Graham's contributions to medicine and his leadership in the profession mark-

ed him as one of Canada's outstanding medical figures.

He leaves his wife, Kathleen Jane; son, John W.; and daughter, Janet H. Graham, all of Toronto.

JAMES HAROLD BEST — Dr. J. H. Best of Winnipeg, Manitoba died on December 21, 1962. He was 68. Dr. Best was born in Madoc, Ontario in 1894. Following graduation from the Royal College of Dental Surgeons of Ontario in 1921 he practised in Winnipeg. He is survived by two sons, Dr. Bruce H. Best of Portland, Oregon and James B. Best of Winnipeg; one daughter, Mrs. S. A. Orchard of Saskatoon; a brother, Foster Best of Vancouver; one sister, Mrs. B. E. Cowan of Winnipeg; and seven grandchildren.

JOSEPH CAMILLE LIONEL COUTU — Le Dr J. C. L. Coutu de Verdun, P. Qué., âgé de 62 ans, est décédé le 29 novembre 1962. Il était né à Joliette, P. Qué. en 1900. Il obtint son diplôme en chirurgie dentaire à l'Université de Montréal en 1928.

THOMAS WALTER DAWSON — Dr. T. W. Dawson of Toronto died on December 30, 1962. He was 78. A native of Bailieboro near Peterborough, Ontario, Dr. Dawson graduated from the Royal College of Dental Surgeons of Ontario in 1910. He practised in Toronto for forty-five years until his retirement in 1956. He is survived by his wife, Helen; a son, Dr. John Dawson of Calgary; a daughter, Mrs. Margaret MacKenzie of Toronto; two brothers, William Dawson of Bailieboro, Ontario and Fred Dawson of Exeter, Ontario; and two sisters, Mrs. H. S. Dawson and Ann Dawson, both of Toronto.

JOHN SIMON DOHAN — Dr. J. S. Dohan of Montreal, P. Quebec died on December 14, 1962. He was 79. Dr. Dohan was born in Danville, P. Quebec and received his early education there. He attended Bishop's University and graduated from McGill University in 1906. He was the only Canadian ever to become president of the American Academy of Restorative Dentistry to which position he was elected in 1957. From 1921 to 1922 he was president of the College of Dental Surgeons of the Province of Quebec.

JOHN THOMAS HACKETT — Dr. J. T. Hackett of Toronto, Ontario died on December 5, 1962. He was 82. Dr. Hackett was born in Hockley, Ontario in 1880 and graduated from the Royal College of Dental Surgeons of Ontario in 1906. He practised in Hockley until 1908 when he moved to Weston where he practised until 1958. He was appointed to the York Township Dental Clinic in 1958 which appointment he held until his death. He was made a life member of the Royal College of Dental Surgeons in 1956. Dr. Hackett is survived by a brother, Dr. Joseph Hackett of Orangeville, Ontario.

REJEAN LAFLEUR — Le Dr R. Lafleur de Shawinigan-Sud, P. Qué., âgé de 32 ans, est décédé le 29 novembre 1962. Il était né à Grand'Mère, P. Qué. en 1930. Le Dr Lafleur obtint son diplôme en chirurgie dentaire à l'Université de Montréal en 1958.

THOMAS EARL McLAUGHLIN — Dr. T. E. McLaughlin of Williamsburg, Ontario died on November 26, 1962. He was 63. Born in 1899, Dr. McLaughlin graduated from the University of Toronto in 1927. He is survived by one brother, Edward McLaughlin, and a sister, Lillian.

CHARLES ELGIN MORGAN — Dr. C. E. Morgan of Guelph, Ontario, died on November 30, 1962. He was 67. Dr. Morgan was born in 1895 in Aultsville, Ontario. He graduated from the Royal College of Dental Surgeons of Ontario in 1920. During World War I he served with the Royal Flying Corps. He is survived by his wife, Elsie M.; two sons, Robert E. Morgan and Donald C. Morgan; one daughter, Mrs. Donald Dunn.

JOSEPH RYAN — Dr. J. Ryan of Toronto, Ontario died on October 16, 1962. He graduated from the Royal College of Dental Surgeons of Ontario in 1917 and practised in Toronto.

THOMAS WILLIAM WARNER — Dr. T. W. Warner of Yarker, Ontario, died on May 15, 1962. He graduated from the Royal College of Dental Surgeons of Ontario in 1923. Dr. Warner is survived by his wife, Florence.

announcements

CONVENTIONS OF THE CANADIAN DENTAL ASSOCIATION

1963	Toronto, Ontario	May 19-22
1964	Edmonton, Alberta	June 28-July 1
1965	Quebec City, Quebec	May 30-June 2

FUTURE EVENTS

<i>Date</i>	<i>Function</i>	<i>Location</i>	<i>Officer</i>	<i>Address</i>
March 28-29, 1963	Alberta Dental Association	Hotel Palliser, Calgary	Dr. D. L. Thompson	206 Medical Arts Building, Calgary, Alberta
April 15-20, 1963	15th International ARPA Congress	Polytechnic Institute, Athens, Greece	Dr. O. A. Louridis	8 Hippocratous Street, Athens, Greece
April 29-May 4, 1963	Dental Association of South Africa	Johannesburg, South Africa	Dr. C. J. Dreyer	P.O. Box 5247, Johannesburg, South Africa
May 12-15, 1963	British Columbia Dental Association	Harrison Hot Springs Hotel, B.C.	Dr. W. R. Upton	325-925 West Georgia Street, Vancouver, B.C.
July 1-3, 1963	Atlantic Provinces Dental Association	Fredericton, New Brunswick	Dr. K. A. Hetherington	98 York Street, Fredericton, N.B.

POSTGRADUATE AND REFRESHER COURSES (CANADA)

TORONTO—The Department of Dental Oral Surgery and Anaesthesia, Faculty of Dentistry, University of Toronto offers a postgraduate course in **ORAL SURGERY**, April 22-26, 1963. Management of surgical problems met by the general practitioner will form the basis for this review of the general principles of surgery. Instruction will be given in anaesthesia for dental operations. Sessions will be devoted to diagnosis, systemic factors relating to oral surgery, chemo therapy and pre- and postoperative case management. Specific problems discussed will include jaw factors, sinus involvements, cysts, root resection, abnormal fraena, malposed and impacted teeth, cellulitis and deep neck infections. Sessions will be conducted in the operating room of the teaching hospitals of this faculty. This course will be directed by Dr. A. A. Antoni. Tuition fee \$100.

Enquiries and requests for application forms should be directed to the chairman, Division of Postgraduate Studies, Faculty of Dentistry, University of Toronto, 124 Edward Street, Toronto 2, Ontario.

POSTGRADUATE AND REFRESHER COURSES (U.S.)

COLUMBIA—April 3-5, 1963—Applied Radiographic Cephalometry
NEW YORK—April 5, 1963—Ultrasonics in Periodontal Therapy
NEW YORK—April 10-12, 1963—Partial Dentures
NORTHWESTERN—April 1-2, 1963—Practical Approach to the Use of Gold Foil
OHIO STATE—April 1-5, 1963—Paedodontics and Interceptive Orthodontics
OHIO STATE—April 8-12, 1963—General Anaesthesia
PENNSYLVANIA—April 1-5, 1963—Practical Procedures in Oral Rehabilitation
PENNSYLVANIA—April 6, 1963—Ultrasonics
TEMPLE—April 1-5, 1963—Immediate Surgical Endodontics
TUFTS—April 1-2, 1963—Quadrant Amalgam Technique
TUFTS—April 1-5, 1963—Special Participation Course in Periodontology
TUFTS—April 12, 1963—Complete Dentures
WESTERN RESERVE—April 19-21, 1963—Current Periodontal Therapy
YESHIVA—April 4-5, 1963—Anaesthesiology

Note • Due to lack of space the Journal cannot accommodate all announcements of foreign dental meetings and postgraduate and refresher courses. Readers are invited to write to C.D.A. headquarters for information concerning unlisted meetings and courses. Further information concerning listed meetings and courses should be sought from the sponsoring institution.

L'Association Dentaire Canadienne

Volume 29
Numéro 2
février 1963

JOURNAL

The Canadian Dental Association

Elaboration d'un diagnostic en endodontie: 1

par Gérard Lussier, D.D.S., Montréal, P.Qué.

Un diagnostic, en général, est l'art de distinguer ou d'identifier une maladie et il est basé sur ce que l'on entend, l'on voit, l'on sent, l'on observe et l'on synthétise. Le diagnostic en endodontie, repose sur une série d'épreuves qui comprennent l'inspection, la palpation, et la percussion avec les doigts ou certains instruments. Il faut inclure en plus un examen radiologique, un test vitalométrique et, quelquefois, des biopsies et des tests biochimiques.

Pour un diagnostic, il faut trois choses: (1) un patient, (2) un dentiste, et (3) une histoire de cas. Subjectivement parlant: une histoire de cas venant du patient et objectivement parlant: un examen clinique fait par le dentiste. Celui-ci doit considérer chez son sujet le point de vue médical et dentaire.

En voyant son patient, le dentiste, d'un seul coup d'œil, doit faire certaines observations générales telles que:

1. son âge
2. son tempérament
3. ses infirmités physiques
4. son hygiène générale

*Première partie d'une conférence prononcée à la Société dentaire de Montréal, le 23 octobre 1962.

5. la couleur de sa peau: pâle, lisse, cyanotique, etc.

6. la guérison lente de certaines plaies apparentes.

Ensuite il devra demander à son patient s'il a déjà souffert de certaines maladies ou allergies, par exemple: (1) fièvres rhumatismales; (2) réactions à certains médicaments tels que penicilline, sulfas, etc.; (3) réactions aux solutions anesthésiques locales.

Il faut laisser le patient décrire lui-même sa douleur: i-e. en donner:

1. sa location exacte
2. son genre: (a) sourde, (b) forte, (c) lancinante.
3. sa durée: (a) continue, (b) intermittante, (c) fréquente.

Le dentiste doit ensuite faire son examen clinique en considérant d'abord la dent dans son ensemble et ensuite la gencive.

La dent dans son ensemble.—Considérer certaines qualités telles que:

(a) translucide ou décolorée. Notons qu'à cet effet l'opérateur doit avoir un bon œil, une bonne lumière. Il doit aussi bien assécher la dent pour en voir la couleur exacte.

- (b) sensible—au toucher
- (c) mobile
- (d) sortie de son alvéole
- (e) présence de cavité
- (f) pulpe exposée
- (g) canal vide
- (h) hyperplasie de la pulpe
- (i) si la structure de la dent supportera une bonne restauration une fois le travail d'endodontie terminé
- (j) enfin si la dent est importante ou non.

La gencive.—A noter:

(a) présence de fistule. (Souvent il faut assécher les tissus pour bien voir).

(b) présence d'enflure: (1) extra orale: visible à l'œil; (2) intra orale: au moyen de palpation.

Souvent un diagnostic est très juste après seulement un examen subjectif et

objectif. Mais, pour plus de sûreté, il vaut mieux continuer celui-ci et découvrir davantage au moyen de tests diagnostiques. Ainsi on pourra découvrir si la pulpe est:

1. vivante
2. pathologique et à quel degré
3. susceptible d'être guérie
4. entourée à son apex de cellules pathologiques

5. dans un état tel qu'elle devra être extirpée ou nécessiter une résection apicale.

C'est pourquoi, certains tests cliniques sont favorables, comme aides au diagnostic.

Le premier test consiste dans la percussion: celle-ci peut s'effectuer au moyen des doigts ou de certains instruments. Il est à noter qu'il faut toujours comparer en frappant sur les dents voisines à la dent sensible. Mieux vaut souvent presser avec les doigts dans une direction et dans l'autre que de frapper avec un instrument dans une seule direction.

En second lieu, la palpation: test qui consiste à déterminer par le toucher et avec une légère pression, la consistance des tissus sous le bout des doigts. Ainsi on trouvera s'il y a présence d'enflure et si le tissu est dur ou mou, rugueux ou lisse. On pourra aussi déterminer s'il y a enflure des ganglions. A noter que la palpation est importante pour décider si une incision doit être faite ou non pour drainage, car on doit pratiquer une incision seulement lorsque l'enflure est venue dure et qu'elle ramollit.

N'oublions pas un test important: celui de la mobilité; et le meilleur moyen de le faire est avec ses deux doigts. Ainsi on peut distinguer trois degrés de mobilité d'une dent:

1. léger mouvement de la dent dans son alvéole
2. mouvement dans l'alvéole moins de 1 mm.
3. mouvement dans l'alvéole s'étendant à plus de 1 mm.

Si la dent répond à ce stage, il vaudra mieux ne pas tenter de travail d'endodontie à moins que celle-ci puisse être traitée avec succès pour en réduire la mobilité. Notons que ceci exclut tout-à-fait le cas d'abcès alvéolaire aigu.

Le test qui est le plus communément employé par le dentiste est la radiographie (6e sens du dentiste). Cette épreuve a vraiment son utilité et elle permet de:

1. dépister la présence d'une carie à son début ou en forte progression;
2. voir la pulpe de la dent: (a) le nombre de canaux; (b) le trajet des canaux; (c) la forme, la longueur et la largeur des canaux;
3. voir si la pulpe est calcifiée, ou si la chambre pulpaire est remplie d'une substance inerte et opaque;
4. distinguer s'il y a un épaissement de la membrane péri-dentaire;
5. donner la nature et l'étendue de la destruction de l'os périapical.

La radiographie suggère plutôt qu'elle ne donne des indications précises.

Voici maintenant un test qui peut prêter à confusion s'il est fait trop rapidement: c'est la vitalométrie. Pour éviter les erreurs, il est important:

- (a) de le répéter deux ou trois fois sur la dent malade et de prendre la moyenne des résultats obtenus.
- (b) de prendre comme guide le test fait sur les dents voisines de la dent malade ou bien sur la dent identique du côté opposé.

Ce test peut donner une réponse inexacte, par exemple:

- (a) sur une dent à plusieurs racines dont la pulpe est vivante dans l'une d'elles et non vivante dans les autres;
- (b) dans les cas de pulpes en décomposition où il se trouve des moisissures dans le canal;
- (c) sur une dent où il y a nécrose partielle de la pulpe;
- (d) quand la partie coronaire est recouverte d'une couronne complète en or ou porcelaine.

Un test que le dentiste n'emploie pas beaucoup, peut-être à cause de sa difficulté d'interprétation, est le test thermique. Il se fait au moyen de la chaleur et du froid et donne de bons résultats comme tests différentiels lorsqu'ils sont employés avec le test électrique. Il est à noter qu'il faut toujours prendre comme témoins les deux dents adjacentes à la dent malade pour en faire une comparaison.

Il ne faudra pas passer sous silence un test qui n'est pas souvent employé, mais qui dans certains cas peut être utile: le test anesthésique. Celui-ci ne peut se faire que lorsque le patient éprouve une douleur, i-e. si celle-ci est diffuse et qu'il ne peut dire si elle provient de la région supérieure ou inférieure. Comme processus, il faut donner une anesthésie mandibulaire, ensuite procéder distalement dans la région supérieure; ainsi par élimination on parviendra à trouver quelle dent est affectée.

SUMMARY

Successful endodontic treatment depends on the establishment of a correct diagnosis. This is determined from an evaluation of the patient's history and from the results of clinical examination and special investigations.

Interpretation of the symptoms is based upon a thorough medical and dental case history. Clinical examination reveals the signs elicited by means of inspection, palpation and percussion. Special investigations embrace radiographic examination, vitality tests and thermal tests. Sometimes it is also necessary to perform additional biopsy and biochemical tests. Care should be exercised, however, in the interpretation of results of special investigations so as to avoid arriving at erroneous conclusions.

2065 Crescent

[À SUIVRE]

Articles pour les journaux nationaux et internationaux

par F. H. Compton,* D.D.S., Toronto, Ontario

Les disciplines scientifiques ont trois moyens à leur disposition pour la dissémination des connaissances et des données techniques: (1) l'enseignement au niveau sous-gradué et au niveau gradué; (2) les réunions des sociétés savantes; (3) les articles écrits. Cette troisième façon d'échanger des notions scientifiques exerce peut-être l'influence la plus profonde, parce que les revues et les livres constituent en quelque sorte un dossier sur la progression des connaissances et une source de renseignements permanente pour les progrès de l'avenir.

Les journaux scientifiques, il faut le dire, jouent un rôle particulièrement important dans l'existence des groupements professionnels. Leur responsabilité est grande et leur fonction est essentielle non seulement aux yeux des rédacteurs, mais aussi pour ceux qui y collaborent et ceux qui les lisent.

QUALITÉS D'UN ARTICLE DIGNE D'ÊTRE PUBLIÉ

L'auteur, qui écrit un article pour un journal, doit répondre à deux exigences: d'abord, il doit avoir quelque chose d'intéressant ou d'important à dire; ensuite il doit, pour transmettre son message, utiliser les mots conformes et les employer à bon escient.

Qu'y a-t-il d'intéressant? Qu'y a-t-il d'important? Les réponses à ces questions

varient selon l'intelligence, l'occupation et les activités sociales du lecteur. Le degré d'intérêt d'un journal dentaire se situe par l'optique des lecteurs beaucoup plus que par leurs préoccupations sociales, mais, quand même, ce degré d'intérêt varie presque à l'infini. Des rapports de recherches, des dissertations sur des états pathologiques, leur diagnostic et leur traitement, des descriptions de techniques, des rapports de cas, des compte-rendus de voyages entrepris pour se renseigner sur des questions dentaires, des commentaires sur l'incidence des maladies dentaires et sur les mesures entreprises dans le public pour les prévenir ou les traiter, l'élaboration de principes portant sur l'éducation en matière de santé; tous ces domaines d'activités scientifiques offrent au dentiste une variété telle de sujets que, muni d'un crayon en face d'une feuille blanche, il peut difficilement résister à la tentation de participer à la création littéraire de sa profession.

Un auteur, croyant que l'expérience qu'il a acquise, les faits qu'il a constatés et les actes qu'il a réalisés pourraient avoir quelque importance et quelque intérêt pour ses collègues et ayant décidé de leur en faire profiter en écrivant un article, un auteur, dis-je, a maintenant la tâche de rédiger sa communication de façon à ce que son lecteur soit intéressé ou amusé ou les deux en même temps. La façon d'atteindre ce but, c'est-à-dire de choisir les mots appropriés et de les mettre dans un ordre correct, est aussi importante que la pleine possession du sujet à exposer. Il en est de cet art, comme de l'acquisition de la science: il s'acquiert par la patience et la persévérance; quelques-

Conférence prononcée devant les élèves de 11^{ère} année de la faculté de chirurgie dentaire de l'Université de Montréal, le 11 décembre 1962.

*Rédacteur du *Journal de l'Association dentaire canadienne*.

uns l'acquièrent plus rapidement, d'autres plus lentement.

L'écrivain, en possession d'un certain vocabulaire, doit l'utiliser pour créer une succession d'impressions qui retiennent l'attention du lecteur. Dans l'art de parler, nous apprenons à assembler des mots dans de belles phrases qui maintiennent le déroulement de notre pensée et exposent la logique de nos intentions; dans le verbe parlé, la personnalité de l'orateur entre en jeu: il peut, en variant son débit, donner de la valeur à certains mots et modifier leur sens par des gestes et des expressions de sa figure. Les phrases écrites sont sèches et statiques; un critique peut à loisir s'y arrêter, trouver leur point faible et les discuter sans risquer d'être contredit.

Il y a de ces maîtres qui écrivent au fil de leur pensée et qui élaborent du premier jet, sans avoir à le corriger, un manuscrit d'un fond et d'une forme impeccables; mais ces individus ne se rencontrent pas à tous les coins de rues. La plupart des communs mortels, dont nous sommes, doivent, pour susciter de l'intérêt chez leurs lecteurs, pour écrire des lignes qui en valent la peine et pour faire naître le désir d'une seconde lecture, la plupart d'entre nous, donc, sont obligés de corriger leur article, encore et encore, et de l'émonder sans cesse. La pensée est plus rapide que l'écriture; l'esprit, en précédant la plume, peut produire des failles ici et là; la pensée, en attendant les mots pour s'exprimer, s'égare parfois dans de nouveaux horizons et risque d'imprimer au texte des apartés qui n'ont plus de séquence logique.

Le métier nécessaire à la rédaction d'un texte honnête peut s'acquérir, à condition de le vouloir et à condition d'y appliquer les principes indispensables. L'esprit doit s'imposer une certaine discipline pour élaborer clairement le texte d'un article; ensuite, après que l'enthousiasme de la création littéraire s'est quelque peu atténué, l'auteur doit s'appliquer une auto-critique pour revoir son texte, pour déceler des lacunes dans l'expression de sa pensée, des accrocs dans son déroulement

logique et, en particulier, des phrases qui n'ajoutent rien à la compréhension. L'épuration d'un texte, pour la majorité des écrivains, consiste surtout à supprimer ces phrases inutiles. Des mots, qui, au premier abord plaisent à l'auteur sous le coup de l'inspiration, paraissent, quelques jours plus tard, fades et dénués de sens. Il faut les supprimer, mais parfois au prix de quels sacrifices!

Nos écrits reflètent nos pensées et illustrent clairement nos standards intellectuels. Une improvisation orale ne peut être corrigée que par la présence d'esprit de l'auditeur; on pardonne facilement des fautes à un orateur; on peut les mettre sur le compte de l'émotion. Un écrit, par ailleurs, aussi passionné soit-il, peut être scruté pour son exactitude et sa clarté. On peut corriger un texte, on peut l'amplifier, le libérer de conclusions illogiques et l'émonder de phrases obscures. On peut aussi l'orner de pensées qui surgissent après l'avoir écrit et ces idées neuves sont souvent meilleures que les premières.

Ce n'est pas facile de corriger un texte. Il faut tout d'abord le clarifier et le simplifier; en ce faisant, on risque de tomber dans la pédanterie ou le terre-à-terre, en lui enlevant toute sa fraîcheur et sa spontanéité. Une correction trop poussée peut supprimer une individualité de bon aloi que renferme tout texte écrit avec sincérité. Ce qui est facile à lire est difficile à écrire et celui-là est bien heureux qui peut améliorer ce qu'il a écrit sans détruire les signes de sa personnalité.

La plupart des articles scientifiques ou techniques ont besoin d'illustrations, qui devraient être utilisées selon les besoins de la communication. Si l'auteur n'en met pas suffisamment, il risque de rendre son article obscur; s'il en insère trop, il s'expose à faire un atlas de son article. Il n'y a pas de mal à écrire un atlas, mais un article écrit pour une revue ne doit pas être un atlas.

Les photographies doivent être en noir et blanc sur papier glacé. Les dessins et les graphiques exécutés avec soin à l'encre de chine et inscrits avec une machine à

lettré ou à l'aide d'un papier lettré.* Les graphiques ou les dessins doivent parfois être rapetissés: les graphiques doivent donc avoir des lettres et des chiffres assez gros qui seront lisibles, même à volume plus restreint. Les dessins ne doivent pas avoir des lettres qui dépassent le minimum nécessaire sur les côtés; la réduction de la largeur du dessin lui-même devra alors être plus considérable qu'il serait nécessaire. Les illustrations ne devraient jamais être collées dans le texte ou sur un carton; elles devraient être envoyées séparément dans des supports adéquats. De même, les tableaux ne doivent pas être inclus dans le texte. Un rédacteur ne rejettera pas un bon article, si l'auteur n'a pas respecté ces règles, mais il vaut mieux y adhérer; ce travail simplifie la tâche de l'imprimeur et permet de hâter la publication d'un article. L'auteur, après avoir réalisé toutes ces conditions et après avoir vérifié son texte "dactylographié" pour s'assurer qu'il a tout dit ce qu'il avait à dire, doit songer à faire publier son article.

CHOIX D'UN JOURNAL

L'auteur qui a préparé un texte pour le présenter à un congrès international ou un congrès national, comme celui de l'Association dentaire canadienne, devra le soumettre pour publication dans le journal de cet organisme. Cependant, l'auteur est libre de choisir son journal, si l'article n'a pas été rédigé dans ce but. Son choix est conditionné par le sujet de sa communication et le genre de lecteurs à qui elle est destinée. Les sujets qui ont un intérêt général se donnent d'habitude à des revues professionnelles, telles que le *Journal de l'Association dentaire cana-*

dienne qui s'adresse à tous les praticiens du Canada. Des articles qui ont une portée plus limitée se destinent à des groupes plus restreints; ces communications plus techniques sont d'ordinaire soumises à des journaux de spécialité, s'il y en a.

Quelques écrivains canadiens, dans le passé, préféraient faire publier leurs articles dans des journaux étrangers, croyant que leurs travaux seraient lus davantage. Cette façon de faire est justifiable dans certaines circonstances, surtout si leurs articles traitent de questions très techniques pour lesquelles il n'y a pas de medium de publication spécialisée au pays. L'envoi d'articles à l'étranger sans raison spécifique est une autre affaire. Le crédit d'un article canadien publié à l'étranger revient définitivement au pays dans lequel il est publié. Cette question aurait moins d'importance, si les dentistes canadiens formaient un groupe nombreux. Mais tel n'est pas le cas. C'est pourquoi, il est normal de songer aux publications canadiennes pour y faire paraître les articles écrits par des Canadiens. D'ailleurs, les revues étrangères reproduisent souvent des articles qui ont d'abord été publiés dans les journaux canadiens et les auteurs sont ainsi assurés que leurs travaux seront lus dans d'autres pays. Le *Journal de l'Association dentaire canadienne* accueille avec joie les articles originaux qui ont de la valeur; il accorde une priorité à ces communications, même si elles sont susceptibles de ne pas tellement intéresser la moyenne de ses lecteurs. Il faut souligner l'expression "valeur originale". Les rédacteurs ne sont pas des experts dans tous les domaines de la chirurgie dentaire; ils doivent parfois soumettre des manuscrits à des consultants familiers avec le sujet et les rédacteurs attachent beaucoup d'importance à l'opinion de ces spécialistes. Cette façon de faire protège les collaborateurs contre une décision arbitraire du rédacteur; elle aide aussi à sauvegarder la qualité et la réputation du journal. En retour, cette discrétion fait du journal un medium alléchant pour les autres auteurs qui pourraient lui soumettre des articles. Il est inutile de dire qu'un ré-

* *Artype*—feuilles à lettré (Artype Inc., Barrington, Illinois), qui peuvent être achetées chez E. Harris, 6637 Jeanne Mance, Montréal 8, P. Qué.

Letraset—pour lettré à volonté, qui peut être acheté chez Visual Planning, 6656 blvd Décarie, Montréal ou chez Affiliated Art Supply, 2375 avenue Ekrs, Montréal, P. Qué.

dacteur n'apportera pas de changements majeurs à un article sans consulter auparavant son auteur.

D'autres articles scientifiques ou techniques doivent trouver place dans un journal parce qu'ils apportent quelque chose et servent de source de référence pour des groupes restreints mais importants de notre profession, par exemple, des dentistes qui exercent dans des spécialités assez limitées.

Un journal consacre aussi de l'espace pour la revue d'articles écrits à l'intention des omnipraticiens; ces résumés d'articles sont fort prisés, mais ils sont difficiles à obtenir. On songe constamment à augmenter le nombre de ces résumés et à améliorer leur clarté.

Il est bon avant de soumettre un texte dactylographié à un journal de se renseigner au sujet des exigences de ce journal, car les journaux ont des traditions différentes. Quelques-uns exigent deux copies, d'autres trois. Il y a aussi des variantes dans la façon d'inscrire les références bibliographiques et il est bon qu'on utilise le genre qu'on exige. Tous les rédacteurs préfèrent que la copie soit dactylographiée à double espace, avec des marges généreuses, sur un seul côté d'un bon papier à lettre (8½ x 11). Il faut toujours envoyer la copie originale, peu importe le nombre de copies au carbone exigées.

Un auteur sans expérience regarde parfois le rédacteur comme un ennemi personnel. Ce n'est pas le cas. Un rédacteur a deux devoirs: l'un, envers sa publication, l'autre envers ses collaborateurs. La plupart du temps, les intérêts du journal et ceux des collaborateurs se confondent. L'article doit convenir au journal; autrement, nul n'en tirerait profit: ni le journal, ni ses lecteurs. Le sujet doit être bien présenté; autrement, l'auteur et le rédacteur regretteront sa publication.

Un rédacteur est toujours disposé à aider un auteur inexpérimenté. Un journal a toujours besoin de nouveaux collaborateurs, comme un cabinet dentaire a toujours besoin de nouveaux patients et

les nouveaux venus trouveront généralement que les conseils qu'on leur donne les aideront à produire un article qu'ils pourront relire plus tard avec satisfaction. Aucun rédacteur aime à manquer un article intéressant: par ailleurs, il n'aime pas à publier quelque chose qui n'est pas à point ou qui n'a pas la forme requise. Il a la responsabilité de s'assurer, dans les limites de ses connaissances, que l'article est présenté dans un style qui confère le plus grand crédit à son auteur.

Tous les rédacteurs préfèrent un texte impeccable aux yeux de leurs consultants comme aux leurs, où le sujet est intéressant et où la dissertation est bien conduite. C'est avec plaisir qu'ils reçoivent un article bien présenté où ils n'ont qu'à inscrire leurs instructions pour le typographe!

Il y a des occasions où même un auteur expérimenté, réputé pour sa science, reçoit des suggestions qui amélioreront une de ses communications, surtout si le rédacteur est assisté de consultants dans tous les domaines des sciences et des techniques dentaires. Peu nombreux sont ceux qui peuvent réellement juger de la valeur de ce qu'ils écrivent. Un auteur, sachant ce qu'il a l'intention d'écrire, croit l'avoir dit dans son article. Dans son esprit seul se remplissent des vides, s'éclaircissent certaines obscurités, se corrigent des fautes contre la syntaxe et se comprennent des raisonnements illogiques. C'est la fonction du rédacteur et de son personnel de protéger l'auteur lui-même contre ces erreurs en scrutant un texte et en s'efforçant de le comprendre. Si un lecteur ne comprend pas intentionnellement un article, un grand nombre de lecteurs feront de même sans s'en rendre compte.

La rédaction d'un article sur n'importe quel sujet est un bon exercice; elle est une source précieuse de connaissance en forçant son auteur à clarifier ses idées, passer au crible ses opinions, vérifier des références qu'il croyait connaître, discipliner son langage et passer en revue son sujet.

DÉCOLORATION DES DENTS
POSSIBLEMENT CAUSÉE PAR
L'ABSORPTION DE TÉTRACYCLINES:
RAPPORT PRÉLIMINAIRE

*Joan Weyman et J. Dennie Porteous.
Brit. D.J. 113:51, 1962.*

Sept enfants examinés récemment à la faculté dentaire de l'hôpital de Sutherland, à Newcastle-upon-Tyne, avaient les dents décolorées et, après étude des cas, on s'est rendu compte qu'il ne s'agissait pas, selon les apparences, de dentine opalescente.

Zegarelli et autres ont rapporté avoir constaté chez 52 enfants dont l'âge variait de 9 mois à 16 ans et qui souffraient tous de maladie fibrocystique du pancréas, que 38 d'entre eux avaient des taches brunes et gris foncé sur les dents; ces auteurs prétendaient alors, en attendant d'autres recherches sur les effets de la fibrose kystique du pancréas sur les tissus de la cavité buccale, que ces taches pouvaient être causées par une médication antibiotique, entr'autre l'absorption de tétracyclines.

Une constatation importante faite au sein du groupe d'enfants dont il est fait mention ici est, qu'au nombre des sept qui avaient des dents grises et brunes, trois ne souffraient pas de fibrose kystique du pancréas. Ces trois enfants avaient souffert, bébés, d'ostéite, 2, au maxillaire supérieur, 1, au maxillaire inférieur. Tous les cas rapportés précédemment étaient vraisemblablement des enfants qui avaient souffert de cette maladie du pancréas, mais, dans ces cas-ci, les auteurs sont certains que la décoloration grise

brunâtre produite dans les deux maladies est la même.

On peut aussi noter, chez le groupe d'enfants aux dents décolorées, qu'il semble y avoir une corrélation entre l'époque de l'absorption de tétracycline et la décoloration des dents. Les dents primaires et le bout des incisives permanentes ne se sont pas décolorées, quand les enfants ont été traités à la tétracycline à partir de 11 mois et après. De même, quand la médication à la tétracycline avait été prescrite au cours des six premiers mois, les dents primaires s'étaient décolorées; mais aucune permanente.

Bevelander et autres² et Boyne et Miller³ ont montré que la tétracycline se fixe dans les tissus calcifiés, os ou dents, au moment de leur élaboration. La tétracycline a une affinité pour certains métaux, particulièrement pour le calcium, et elle s'y dépose durant leur élaboration. La tétracycline est une substance jaune et elle a des reflets dorés.

Deux des cas rapportés avaient des dents jaunes, qui émettaient des reflets dorés sous une lampe à rayons ultra-violets et, dans un cas, un spécimen d'os prélevé au cours d'une autopsie avaient les mêmes propriétés.

L'absorption de tétracycline durant la période de formation des dents constitue un facteur commun dans tous ces cas d'apparition de taches jaunes ou brunes; cependant il n'y a pas de relation constante dans les histoires médicales de ces patients; il semble probable, puisque la tétracycline émet des reflets dorés aux rayons ultra-violets et que le même phénomène s'est produit dans deux cas montrant une pigmentation jaunâtre, qu'il y a présence de tétracycline dans ces dents.

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L'INFLUENCE DES APPAREILS D'ORTHODONTIE SUR LA FRÉQUENCE DE LA CARIE

Bengt Ingervall.

Odont. Revy 13:175, No 2, 1962.

On se demande avec raison si les appareils d'orthodontie favorisent la carie dentaire.

Noyes (1936) a examiné cent patients qui avaient subi des traitements d'orthodontie et il a trouvé que les traitements n'avaient pas produit d'augmentation dans l'incidence de la carie. De même, Dolce (1950) n'a pas trouvé que les traitements d'orthodontie créaient un climat "alarmant" de carie. Burrill (1941) émit l'opinion que les patients qui, avant le traitement d'orthodontie, montraient une grande susceptibilité pour la carie, bénéficiaient d'une réduction dans l'incidence de la carie après le début du traitement à cause d'une surveillance plus poussée de l'hygiène de la bouche. Owen (1949) a trouvé que le nombre des lactobacilles augmentait après la mise en place d'un appareil d'orthodontie. De plus, l'augmentation des lactobacilles était en rapport avec le nombre de dents sur lesquelles il y avait des bagues et la durée du séjour des bandes sur les dents.

En résumé, la question à savoir si la carie est plus fréquente au cours des traitements d'orthodontie a été étudiée sous deux angles: Noyes et Dolce ont fait des recherches sur la fréquence des caries après les traitements; Burrill et Owen, sur l'activité de la carie au cours des traitements, en utilisant des épreuves cliniques et bactériologiques. Les données

de ces recherches se contredisent. C'est pourquoi, l'auteur a entrepris une étude sur l'effet des appareils cimentés sur la fréquence de la carie. Il a établi une comparaison des écarts dans la fréquence de la carie chez 60 enfants qui avaient subi des traitements d'orthodontie à l'aide d'appareils cimentés et chez 60 enfants n'ayant pas subi de traitement pris comme groupe de contrôle.

Les examens se sont faits à l'aide d'un miroir et d'un explorateur et des radiographies intra-orales des quadrants postérieurs et antérieurs; on enregistrait les lésions de caries révélées par la radiographie, les caries décelées par l'examen clinique et les défauts d'émail susceptibles de se modifier en carie.

Cette enquête a montré que les enfants ayant subi des traitements d'orthodontie souffrent plus fréquemment de carie que les autres. Le pourcentage des caries plus nombreuses s'est chiffré à 50%. L'augmentation des caries était plus restreinte, mais n'apportait pas de changement significatif dans les statistiques, si on ne tenait pas compte des défauts d'émail susceptibles de devenir des caries.

Le genre d'appareils d'orthodontie influence la répartition des caries. Des bandes complètes semblent protéger les dents contre la carie. Les bandes qui ne couvrent pas le tiers gingival de la face buccale des dents, comme on les utilise pour les dents antérieures, protègent contre les caries proximales, mais favorisent la carie sur la face buccale. Les incisives supérieures, avec des bandes, se carient plus fréquemment aux faces linguales.

L'auteur recommande de badigeonner les dents avec du fluor avant d'y fixer des appareils d'orthodontie. Le patient, à la maison, devrait se rincer la bouche avec un rince-bouche contenant du fluor; il conseille, chez les enfants qui souffrent de susceptibilité à la carie, de couvrir les dents antérieures avec des bandes complètes. Il est important, pour prévenir la décalcification de la dent sous des bandes décelées, de s'assurer à chaque visite que les bandes sont bien cimentées.

"Toi, tu ferais un bon dentiste . . ."

Devant la situation présente et surtout devant l'éventualité de la dentisterie d'Etat, il est un problème que notre Association étudie et qu'il est impérieux de régler. Les statistiques et les résultats d'enquêtes démontrent, en effet, que la profession dentaire, au Canada, manque de personnel.

L'évidence de cette pénurie de dentistes est frappante et on ne peut que s'alarmer devant son importance et devant l'urgence de sa correction.

Jusqu'à quel point le problème a-t-il de l'importance? Il en a jusqu'à répondre de la santé dentaire des Canadiens. On constate, et cela avec satisfaction, que le pourcentage de la population fréquentant régulièrement le dentiste augmente sans cesse, grâce au travail efficace de nos ligues d'hygiène dentaire. Si ce public croissant ne peut pas recevoir de services adéquats à cause du manque de dentistes, aussi bien suspendre les leçons d'hygiène et de prévention, ce qui serait un non-sens, évidemment.

Les chiffres publiés annuellement par notre Journal nous prouvent la nécessité d'augmenter nos effectifs, puisque le nombre maximum de gradués au Canada ne rencontre pas les besoins créés par les départs de confrères d'une part, et l'accroissement de la population canadienne d'autre part.

La gravité du problème nous intéresse tous, car, après tout, nous sommes den-

tistes non seulement pour faire des cavités et les remplir, ni uniquement pour faire de l'argent, mais nous faisons partie d'un corps qui a pour but la préservation et la conservation d'un organe important du corps humain. Même si cela semble faire figure de cliché, c'est un devoir pour nous de jeter les yeux en dehors des murs de notre bureau pour faire notre part dans le soin de la santé dentaire du public en général.

Quant à l'urgence du problème, elle n'est pas moins évidente. Ce n'est pas du jour au lendemain que la profession dentaire pourra compter sur mille ou deux milles sujets de plus; et le besoin se fait déjà sentir. Des villes de population moyenne où les dentistes sont surchargés d'ouvrage au point de devoir remettre les rendez-vous à plusieurs mois parfois; des villes de moindre importance qui n'ont qu'un dentiste épuisé par d'interminables heures de bureau ou qui n'en ont pas du tout. Ce sont là des situations anormales dont la correction s'impose et doit s'effectuer dans un avenir très rapproché.

En plus de tout cela, l'âge moyen des dentistes canadiens augmente: ce qui signifie que bientôt un nombre imposant de confrères abandonneront la pratique, bon gré mal gré. Les recrues suffiront-elles à combler ces vides dans les mêmes proportions? On ose à peine l'espérer.

Il semble que le recrutement soit une des seules solutions à ce problème im-

portant et urgent. Mais il s'agit là d'un plan à longue échéance, puisque ce n'est qu'après les études des recrues qu'il amènera des résultats.

Comment faire du recrutement efficace? Les associations, le Collège et les sociétés dentaires à tous les niveaux y ont pensé longtemps et y pensent encore, cherchant la formule idéale. Ces organismes ont obtenu, jusqu'à date, un succès quelconque, handicapés qu'ils étaient, peut-être, par le nombre limité d'espace dans nos facultés dentaires.

Par ailleurs, nous, dans notre coin individuel, sommes peut-être trop portés à laisser tout le travail aux associations, les privant souvent de suggestions qui, après étude, pourraient s'avérer pleines de bon sens.

En voici une qui vaut probablement moins que ce qu'en pense son auteur, mais qui est tout de même facile à appliquer: pourquoi chaque dentiste, dans son bureau, dans son milieu, ne ferait-il pas sa part de recrutement?

Cela, évidemment, implique une profonde conviction de notre part, c'est-à-dire un amour sincère de notre profession, basé sur des principes qui nous font voir avec plus d'intérêt les bons côtés de notre travail, pour en venir, selon l'adage, à aimer ce que nous faisons, et non pas à faire ce que nous aimons. Ainsi, libres de tout préjugé, nous pourrions plus facilement faire rayonner autour de nous et aussi communiquer aux autres cette satis-

faction que nous éprouvons à pratiquer un métier humain dans la force du mot.

Il s'est donné, dans des collèges, et il se donne encore, je crois, des causeries d'orientation, où des confrères vont informer la gent étudiante de ce qu'est la profession dentaire. Malgré toute la ferveur et la bonne volonté qu'ils y mettent, ces confrères méritants ne peuvent pas atteindre le niveau de persuasion qu'ils voudraient, car lorsqu'on veut obtenir quelque chose d'une personne, ce n'est ni une lettre, ni un téléphone, ni une conférence de ce genre qui y réussira. Rien ne vaut un contact personnel.

Et j'en arrive à suggérer un moyen où l'entrevue personnelle entre en jeu. Parmi les jeunes étudiants qui ont recours à nos services, il en est, sans aucun doute, chez qui nous remarquons certaines aptitudes pour notre profession. Pourquoi, lors d'une de leurs visites, ne pas aborder le sujet de l'orientation en leur disant: "Toi, tu ferais un bon dentiste..."

Il serait surprenant de constater l'intérêt que quelques minutes de conversation pourront susciter chez un jeune homme sur le point de choisir une carrière. Si le goût, semé par nous, s'ajoute à ses aptitudes, il devient alors un sérieux candidat. Et les effets de notre "prédication" retomberont sur nous pour augmenter notre propre conviction et ainsi nous rendre nous-mêmes bénéficiaires de notre effort.

C.T.,

Recrutement à la profession dentaire • Tout dentiste, par son exemple et par les services qu'il rend à son entourage, peut susciter un sentiment de respect qui porte les autres à faire partie de la profession. — G. H. Leatherman, secrétaire général de la Fédération dentaire internationale.

Recrutement d'étudiants • Neuf provinces ont des programmes actifs pour le recrutement d'étudiants en chirurgie dentaire; deux provinces seulement s'occupaient de cette question avant que l'Association dentaire canadienne organise un comité national de recrutement, en 1961.

L'Association

DIPLÔME DE MEMBRE HONORAIRE DE L'A.D.A. AU DOCTEUR HARVEY REID

L'Association dentaire américaine a décerné au docteur Harvey A. Reid, de Toronto, un certificat de membre honoraire, au cours de son congrès annuel qui a eu lieu récemment à Miami. Le docteur Reid a été président de l'Association dentaire canadienne en 1945-46. Il fait partie du conseil d'enseignement et il fut, durant de nombreuses années, président du comité d'études sur l'assurance-santé de l'Association. Il a été nommé, depuis peu, membre du bureau de fiducie du Fonds canadien pour l'enseignement dentaire.

LE DOCTEUR WHYTE NOMMÉ AU CONSEIL DE SANTÉ

Le docteur J. P. Whyte de Swift Current, Saskatchewan, selon un rapport du Ministère fédéral de santé, a été nommé membre du Conseil de santé du Dominion. Ce conseil est l'organisme consultatif le plus important du Ministère de la santé nationale et du bien-être social au sujet des questions qui touchent la santé des Canadiens. Le docteur Whyte est un ancien président de l'Association dentaire canadienne.

LE COLLÈGE AMÉRICAIN DES DENTISTES HONORE LE SECRÉTAIRE DE L'A.D.C.

Le Collège américain des dentistes a rendu hommage au secrétaire de l'Association dentaire canadienne, le docteur Don W. Gullett,

en lui décernant le prix William John Gies. Le texte, qui accompagnait l'octroi du prix au docteur Gullett, fut lu par le docteur P. G. Anderson, de Toronto, au cours d'une réunion du Collège tenue à Miami en même temps que le congrès de l'Association dentaire américaine.

Le Collège, de temps à autre, reconnaît le mérite d'un de ses membres qui contribue "aux progrès de la profession et à ses relations extérieures en se consacrant d'une façon extraordinaire à la tâche de porter plus loin les frontières de la profession."

NOUVEAU FASCICULE

On peut se procurer au secrétariat de l'A.D.C., au prix de \$1.65 le cent, un nouveau fascicule intitulé "Dental Health Guide for teachers and parents." Ce fascicule est une ré-édition d'un plus ancien portant le même titre. Des publications du genre se font sous l'égide du conseil d'hygiène dentaire publique.

Le Canada

TROIS-RIVIÈRES ADOpte LA FLUORATION

Le 4 septembre dernier, le conseil de ville des Trois-Rivières décidait à l'unanimité d'adopter la fluoration de l'eau de son aqueduc. Trois-Rivières devenait ainsi la vingtième ville de la province de Québec à faire bénéficier sa population des avantages de la fluoration de l'eau; elle devenait aussi la première ville du Québec d'une population

Au cours d'une cérémonie à l'occasion de la fluoration à Trois-Rivières, on voit de g. à d.: le docteur Guy Boisclair, D.H.D.P., propagandiste de la Ligue d'hygiène dentaire de la province de Québec pour le district des Trois-Rivières; le docteur Gabriel Lord, président de la Ligue; son Honneur le maire J. A. Mongrain; et le docteur Ephrem Vinet, administrateur de la Ligue.



d'au-delà de 50,000 habitants à fluorer son eau.

La ville des Trois-Rivières, dont le maire est M. J. A. Mongrain, est une ville progressive et une ville qui adhère spontanément à toutes les mesures susceptibles d'améliorer la santé de ses contribuables.

La profession dentaire et la population de la ville des Trois-Rivières sont très reconnaissantes à la Ligue d'hygiène dentaire de la province de Québec et à son propagandiste, le docteur Guy Boisclair, pour la campagne fructueuse qu'ils ont menée en faveur de cette mesure.

Il est à souhaiter que l'exemple donné par la ville des Trois-Rivières fera bouger les autres grandes villes de la province de Québec.

RÉFÉRENDUMS SUR LA FLUORATION EN ONTARIO

Plusieurs villes d'Ontario ont tenu leurs élections municipales en décembre dernier et les dentistes, avant ces élections, ont été invités à faire de la propagande auprès de leurs amis, leurs voisins et leurs patients afin que ceux-ci se prononcent en faveur de la fluoration, car des plébiscites avaient lieu en même temps sur cette question.

Windsor, Sarnia, London, Hamilton, Toronto et Ottawa étaient parmi les municipalités d'Ontario qui avaient des référendums sur la fluoration au mois de décembre. Les sociétés dentaires ont mené des campagnes actives en faveur de cette mesure. Toronto et Windsor ont donné une réponse affirmative à la fluoration. Le nombre des Canadiens qui consomment de l'eau fluorée (presque deux millions à date) aurait été

doublé, si toutes ces villes avaient donné une réponse affirmative.

Les lois d'Ontario permettent la fluoration soit par décision du conseil municipal ou par un référendum. Si dix pour cent des voteurs d'une municipalité demandent un plébiscite, la municipalité doit soumettre la question au vote et cette municipalité est liée par ce vote. Il suffit d'une simple majorité.

A Windsor, l'eau a été fluorée, il y plusieurs semaines, à la suite d'une décision du conseil; cependant les autorités municipales ont décidé de soumettre cette question aux lois, même si le nombre des requérants d'un référendum n'atteignait pas les dix pour cent exigés. Dans le Toronto métropolitain, chacune des 13 municipalités constituantes ont eu un référendum. Pour instituer la fluoration dans une région métropolitaine, il faut que la majorité se prononce en faveur de cette mesure.

Chronique internationale

DIPLÔMES DÉCERNÉS À DES AUXILIAIRES, EN ANGLETERRE

Tiré du *Times* de Londres, le 30 juillet 1962:

"Le problème du piètre état des dents des enfants a été partiellement résolu par la fin de deux années d'études des premières 50 jeunes filles, de 17 à 25 ans, qui recevront demain leurs prix et

leur diplôme d'auxiliaire dentaire. Leur nombre est relativement petit si on songe à tous les travailleurs dentaires dont on aurait besoin, mais, néanmoins, la graduation de ces 50 jeunes filles influencera peut-être le Ministère de la santé et les autorités locales à élaborer de nouvelles politiques au sujet des futures auxiliaires dentaires. Ces jeunes filles commenceront à travailler dans des cliniques parsemées par tout le pays dans les cadres du Service national de santé.

"Ces auxiliaires dentaires s'occuperont exclusivement des enfants; elles gratteront, nettoieront et poliront les dents, elles entreprendront des obturations simples et elles extraieront les dents primaires sous la surveillance d'un chirurgien-dentiste.

"Ces premières cinquante auxiliaires dentaires pourront travailler à la clinique de leur choix — dans la plupart des cas, près de leur demeure; mais, à l'avenir, elles devront exercer là où il se produira des vacances et où les autorités locales solliciteront leurs services.

"Des candidatures pour ces cours arrivent de tous les coins du pays et, en fait, le Conseil dentaire général déclare qu'il y a plus de demandes qu'on ne peut en satisfaire à cause du coût de ces cours.

"Il est certain que ces auxiliaires féminines joueront un rôle important dans les services dentaires de l'avenir, si elles persistent dans leurs fonctions, parce qu'elles dépendent, dans certaines régions, de dentistes qui travaillent à demi-temps, et parce qu'il y a pénurie de dentistes dans presque tous les comtés.

"Le cours de deux ans, qui se donne à l'Ecole des auxiliaires dentaires située sur le terrain du New Cross General Hospital, à Londres, accorde une subvention de £240 pour la première année et de £250 pour la seconde année; le Ministère de la santé donne des octrois qui sont soustraits au contrôle des parents—ce qui rend la chose alléchante pour plusieurs jeunes enthousiastes de liberté!

"Ces filles, pour être admises au cours d'auxiliaire dentaire, doivent avoir réussi quatre ou cinq examens du Certificat général d'éducation, comprenant l'anglais, les mathématiques et un sujet scientifique; mais le règlement est assez élastique, même si elles n'ont pas réussi leurs mathématiques, elles peuvent être jugées soit sur leur anglais et soit un sujet scientifique; et les jeunes filles qui font preuve, en dehors du certificat général d'éducation, d'une instruction convenable, peuvent être acceptées.

"Les salaires de ces auxiliaires, au début, se chiffrent à £525, par année, et peuvent se rendre par 11 augmentations annuelles, jusqu'à £790, tout en restant sujets aux changements qui peuvent être faits dans leur échelle pour ce genre de travail. Elles peuvent continuer à travailler une fois mariées, car on s'attend à ce qu'elles se marient très tôt, ce qu'elles peuvent faire d'ailleurs au cours de leurs études."

LA FLUORATION SE RÉPAND EN HOLLANDE

L'Association dentaire de Hollande annonce que, très bientôt, 30 pour cent des 11,500,000

habitants de ce pays consommeront de l'eau fluorée. Cette constatation a été faite après que la ville d'Amsterdam, le 13 juin de cette année, a décidé de fluorer l'eau de son aqueduc. Depuis janvier, plusieurs grandes et plusieurs petites villes ont adopté la fluoration; parmi ces villes, on note Rotterdam, Groningen, l'Île de Goeree-Overflakkee et la province de Gelderland. Les premières expériences sur la fluoration ont eu lieu à Tiel et Gulemborg; ces recherches ont surtout porté chez des écoliers de 10 à 15 ans. Les résultats ont révélé après 6 ans $\frac{1}{2}$ l'efficacité de cette mesure.

Le Conseil de santé, après ces expériences, a publié un rapport intitulé "Prévention de la carie par le fluor" et ce rapport a été abondamment répandu dans le pays. Les autorités gouvernementales, dans la plupart des cas, ont laissé l'adoption de cette mesure à la discrétion des conseils municipaux.

EN AMÉRIQUE, DES PLANS PRÉ-PAYÉS EN PLUS GRAND NOMBRE

La première Conférence nationale sur l'administration des plans pré-payés pour la santé dentaire, tenue récemment à Seattle, Washington, a prédit une multiplication notable des plans pré-payés au cours des dix prochaines années parce que le public s'y intéresse de plus en plus. La Conférence groupait 110 personnes d'au moins vingt états, du gouvernement des États-Unis et du Canada; elle a consisté en des conférences et des colloques qui étaient suivis de questions et de discussions venant de l'assistance. Des experts ont exposé les progrès réalisés dans l'administration et l'organisation de ces plans, leurs contrats de garantie, la procédure utilisée pour les réclamations, les politiques professionnelles, l'établissement des honoraires et les responsabilités des directeurs dentaires. Les participants à la Conférence ont souligné la nécessité essentielle de maintenir la qualité des services tout en cherchant des façons d'élaborer, en libre entreprise, des variétés de plans qui fourniraient à toute la population les bénéfices de traitements dentaires adéquats. Des représentants de corporations de services dentaires de compagnies d'assurances et de cliniques mises à la disposition de syndicats—organismes qui ont jusqu'à maintenant élaboré des plans—ont pris part à la Conférence.

On remarquait, parmi les observateurs du Canada, les docteurs W. M. Joiner, H. J. Killas

et W. R. Upton, de la Colombie Britannique, Paul Luxford et R. L. Rasmussen d'Alberta, P. M. Jackin, de Manitoba et Mme Isabel Brown, directrice du Bureau des recherches économiques de l'A.D.C.

AUGMENTATION AUX ÉTATS-UNIS DU NOMBRE DES PLANS MÉDICAUX, DITS FONDATIONS

Un nouveau système qui assure à ses abonnés des traitements médicaux pré-payés s'avère de plus en plus populaire dans différentes villes des États-Unis. Ce plan, appelé Foundation for Medical Care, a été élaboré par des médecins et il est sous leur contrôle; les patients et les médecins s'en déclarent satisfaits. Ce plan s'enquiert des désirs manifestés par des groupes d'employés pour un système de traitements pré-payés, voit à répondre à ces désirs à un coût que le groupe peut payer et que les médecins acceptent.

La première fondation du genre a été organisée en 1954 par la Société médicale de San Joaquin, en Californie et, depuis, d'autres plans similaires ont été mis sur pied ailleurs. Ces fondations sont entièrement contrôlées par les sociétés médicales des régions, mais elles constituent des corporations autonomes; elles ne sont pas à proprement parler des systèmes d'assurances; elles servent surtout comme des catalyseurs entre les unions et les compagnies d'assurances.

Voici comment ces fondations fonctionnent: un syndicat veut s'assurer contre les frais médicaux; la fondation sert d'intermédiaire entre le syndicat et une compagnie d'assurances. La fondation établit des standards de protection qui conviennent au syndicat; elle fixe la moyenne des primes que peuvent payer les syndiqués en tenant compte de leurs revenus et du niveau relatif des honoraires; elle cherche alors une compagnie d'assurances qui répond à ces exigences. Si plusieurs compagnies se déclarent prêtes à assurer les risques, la fondation soumet les soumissions au syndicat. Celui-ci choisit la police qui lui convient; l'assureur vend l'assurance, perçoit les primes et assume les risques. La fondation, quand la police est en force, revise tous les ans la moyenne des revenus du groupe pour se rendre compte de l'opportunité de modifier la cédule d'honoraires.

Des médecins, bénévolement, examinent chacune des réclamations pour déceler toute

erreur technique et pour contrôler la qualité des services. Les compagnies d'assurances soulignent que leurs pertes sont moindres quand elles font partie de fondations du genre. En un mot, les fondations agissent comme des agents d'assurances. Les assureurs permettent aux fondations de payer promptement à l'aide de chèques tirés sur leur propre compte toute réclamation déclarée justifiée par elles (les fondations). *Medical Economics*, le 24 sept. 1962.

Le Corps dentaire royal canadien

OFFICIERS DE LA DIRECTION EN VISITE AU CAMP BORDEN

Le brigadier K.M. Baird et colonel I.A.L. Millar se sont rendus à l'Ecole du Corps dentaire royal canadien au Camp Borden afin d'interviewer et d'inspecter les élèves officiers et les lieutenants de 2^e classe qui suivent le cours et de participer à la cérémonie qui marquait la fin de l'instruction d'été des élèves de deuxième et de troisième années.

NOUVEAUX OFFICIERS DU CORPS DENTAIRE

Après avoir obtenu leur diplôme de quatre universités canadiennes, douze nouveaux officiers-dentistes ont été promus au grade de capitaine dans le Corps dentaire royal canadien et commenceront leur carrière aux endroits suivants: Cap. N.H. Andrews, Dalhousie — Q.-G., région de Manitoba, Winnipeg; Cap. L.T.F.B. Archambault, Montréal — H.M.C.S. Cornwallis; Cap. P.A.A. Dailyde, Toronto — Griesbach Bks., Edmonton; Cap. W.J. Froese, Manitoba — Q.-G., région de Manitoba, Winnipeg; Cap. T.M. Johnston, Toronto — Q.-G., région de Manitoba, Winnipeg; Cap. G.A. Johnson, Toronto, Réseau routier du nord-ouest, Whitehorse; Cap. V.D. Kvedaras, Toronto — Station de l'A.R.C., Trenton; Cap. J.P.A. Legendre, Montréal — Caserne Currie, Calgary; Cap. N.A. McFar-

lane, Toronto — H.M.C.S. Cornwallis; Cap. A.B. Perkin, Toronto — Hôpital des forces armées du Canada à Kingston; Cap. W.E. Russel, Dalhousie — Camp Gagetown; et Cap. W.J. Sinclair, Toronto — Station de l'A.R.C. à Downsview.

LE COLONEL SHILLINGTON EN EUROPE

Le colonel G.B. Shillington a récemment visité en Europe la 4^e Compagnie dentaire de campagne, commandée par le lt-col. G.E. Evans ainsi que la 35^e unité dentaire de campagne, commandée par le lt-col. L. G. Craigie. Son itinéraire l'a conduit jusqu'à Cologne en Allemagne, où il a assisté à la réunion annuelle de la Fédération dentaire internationale; puis il s'est rendu à Londres où il a conféré avec les chefs des services dentaires de la Marine, de l'Armée et de l'Aviation britanniques.

POSTES D'ÉTÉ

En plus de ceux que nous avons donnés dans notre dernier numéro, voici les noms de ceux qui ont occupé des postes au cours de l'été:

Le major R.J. Bryant, de la Station de l'A.R.C., Portage-la-Prairie, Man., à la Station de l'A.R.C. à Winnipeg.

Le cap. R.D. Bunt, des unités de la Base canadienne au Moyen-Orient à la Station de l'A.R.C., à Trenton.

Le cap. M.D.G. Conrad, de la Station de l'A.R.C. Greenwood, N.-E., aux unités de la Base canadienne au Moyen-Orient.

Le cap. P.J.J. Coulombe, de la 4^e Compagnie dentaire de campagne, en Allemagne, à la Station de l'A.R.C. à Clinton, Ont.

Le cap. R. H. Headley, de 8 C. H. Fort Beauséjour, 4^e Compagnie dentaire de campagne, en Allemagne, à la Q.O.R. of C., Fort McLeod, 4^e Compagnie dentaire de campagne, en Allemagne.

Le cap. J. G. B. Parent, de la Station de l'A.R.C. de St-Jean, P.Qué., à la Station de l'Arc de Goose-Bay, Labrador.

Le cap. W. F. Shaw de Camp Gagetown, N.-B. à la 4^e Compagnie dentaire de campagne d'Allemagne.

Le cap. O. A. Tucker, de la Station de l'A.R.C. de Winnipeg à la Station de l'A.R.C. de Portage-la-Prairie, Man.

TROPHÉES DU CONCOURS DE COMPÉTENCE GÉNÉRALE ORGANISÉ PAR LA MILICE POUR L'ANNÉE 1962

Le trophée Moore, décerné à l'unité qui dans l'ensemble a fait preuve de la plus grande efficacité au cours de l'année d'instruction, a été gagné par la 60^e Unité dentaire (Milice) d'Edmonton, commandée par le lieutenant-col. S. G. Geldart.

Le trophée Trelford, remis à l'unité arrivée deuxième lors du concours, a été adjugé à la 61^e Unité dentaire (Milice) de Vancouver, commandée par le lieutenant-col. P. L. Rondeau.

Le trophée Memorial de l'Association dentaire de la Saskatchewan, présenté à l'unité qui a fait le plus de progrès sur toute la ligne, a été également attribué à la 60^e Unité dentaire (Milice) d'Edmonton. Cette unité n'a pas réussi à gagner de trophée en 1961, mais elle a fait tellement de progrès en un an qu'elle a obtenu la rare distinction de mériter deux trophées cette année.

Une mention honorable a été accordée à la 57^e Unité dentaire (Milice) de Winnipeg, commandée par le lieutenant-col. M. J. Snidal. Cette unité n'a manqué la deuxième place que par une faible marge et c'est en récompense de ce beau succès qu'on lui a remis ce parchemin.

OFFICIERS DENTISTES PROFESSEURS À LA FACULTÉ DE CHIRURGIE DENTAIRE

Au cours de l'année, le doyen de la faculté de chirurgie dentaire de l'Université Dalhousie et celui de l'Université du Manitoba ont demandé le concours de deux de nos officiers pour enseigner. Le directeur général des Services dentaires a donné son assentiment dans les deux cas et les Régions militaires en cause ont accordé à ces deux officiers la permission demandée.

Le colonel A. T. Roger, officier dentiste de la Région militaire de l'Est, commence sa deuxième année consécutive comme professeur de chirurgie buccale à l'Université Dalhousie et le major L. A. Richardson vient d'être accepté comme professeur de travail clinique à l'Université du Manitoba pour la présente année.



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HYPERCEMENTOSIS: Visualized radiographically. 8 examples.

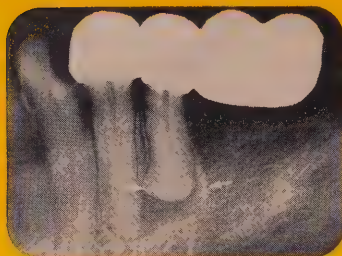


Fig. 1. Hypercementosis associated with chronic periapical infection.



Fig. 2. Same as Fig. 1.



Fig. 3. Hypercementosis associated with Paget's disease of bone. (Note "ground-glass" appearance of maxillary bone.)

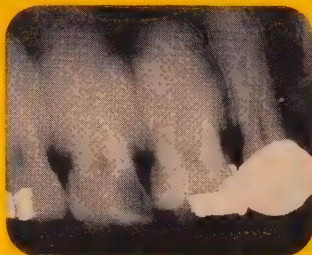


Fig. 4. Generalized hypercementosis of "idiopathic" type. Note the homogeneous density of cement and dentin.



Fig. 5. Another case of generalized hypercementosis. Here the cementum is easily distinguished by its less dense structure.

Hypercementosis, an abnormal increase in the thickness of *cementum*, may affect one or several teeth or be generalized throughout the dentition.

It may appear localized as bulbous or nodular enlargements near or at the root apex (Figs. 1, 2, 6, 7 and 8); or as a symmetrical enlargement of the entire root, (Figs. 4 and 5).

Radiographically, the excessive *cementum* may not be distinguishable as such, since it and the *dentin* may appear as a homogeneous radiopacity of similar density (Fig. 4). At other times, *hypercementosis* appears less dense, thus clearly differentiated from the root *dentin* (Fig. 5).

Diagnosis, however, is easily made from clear, well-balanced radiographs, since the *peridental membrane* and *lamina dura* are situated at the periphery of the excessive *cementum*.

Causes of *hypercementosis* include: (One), low-grade, chronic periapical infection (Figs. 1 and 2). (Two), trauma in the form of excessive or abnormal occlusal stress. (Three), systemic diseases of which Paget's disease of bone is one of the more frequent (Fig. 3). (Four), *idiopathic*, wherein the etiology is indeterminate (Fig. 4).



Fig. 6. Bulbous enlargement of apical third. Note the easily identified periodontal membrane and lamina dura outside the hypercementosis.



Figs. 7 & 8 (below). Nodular forms of hypercementosis.



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1. J.A.D.A. 62:466 (April) 1961. 2. J.A.M.A. 180:94 (April 7) 1962.



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1. Perkins, Robert E.L.: Oral Surgery,
Oral Medicine and Oral Pathology
10:230, 1957.

2. Sherber, D.A.: Am. J. Surg. 86:331,
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lead-er (lēd'ēr), *n.* 1. a person or thing that leads; directing, commanding, or guiding. 2. as of a group or activity. 3. a horse having control over all others in the same hitch or as one of the foremost in the foremost span. 4. a pipe for conveying water. 5. a tendon. 6. a featured article or column offered at an attractive price. 7. a short piece of catgut, used for a hook, lure, etc. 8. to lead. 9. in music, to lead. 10. in an instrumental or vocal solo, to give the solo passages. 11. in nautical usage, a wooden block or metal piece with holes in which leading lines to their proper places. 12. *pl.* in printing, dots, dashes, etc. in a line, used to direct the eye across the page, as in a table of contents.

lead-er-ship (lēd'ēr-shīp'), *n.* [see -SHIP], 1. the position or guidance of a leader. 2. the ability to lead.

lead-in (lēd'in), *n.* the wire leading from the aerial to a radio receiver or transmitter.

lead-in (lēd'in), *adj.* leading in: as, a lead-in wire or cable for a radio receiver.

lead-ing (lēd'ing), *adj.* a covering or being covered with lead. 2. of or for sheets of lead, collectively.

lead-ing (lēd'ing), *adj.* the action of one that leads; guidance; direction. *adv.* 1. that leads; guiding. 2. in chief. 3. playing the lead in a play, motion picture, etc. —*SYN.* see chief.

leading article (lēd'ing ar-ti-kul), *n.* principal editorial or article in a newspaper.

leading edge (lēd'ing ēj), *n.* 1. in aeronautics, the front edge of a propeller blade. 2. in nautical usage, that edge of the hull of a ship which first encounters the wind.

leading light (lēd'ing līt), *n.* 1. a light used to guide ships into and out of a harbor. 2. a person, one of the most important members of a group, etc.

leading question (lēd'ing kwes-tion), *n.* a question in such a form as to suggest the answer.

leading string (lēd'ing strīng), *n.* a string or cord used to support a child or a person who is blind.

lead (lēd), *v.* to lead.

lead (lēd), *n.* a soft, heavy metal.

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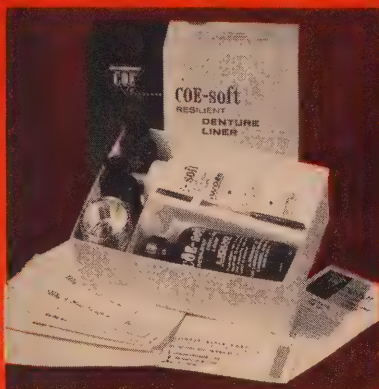
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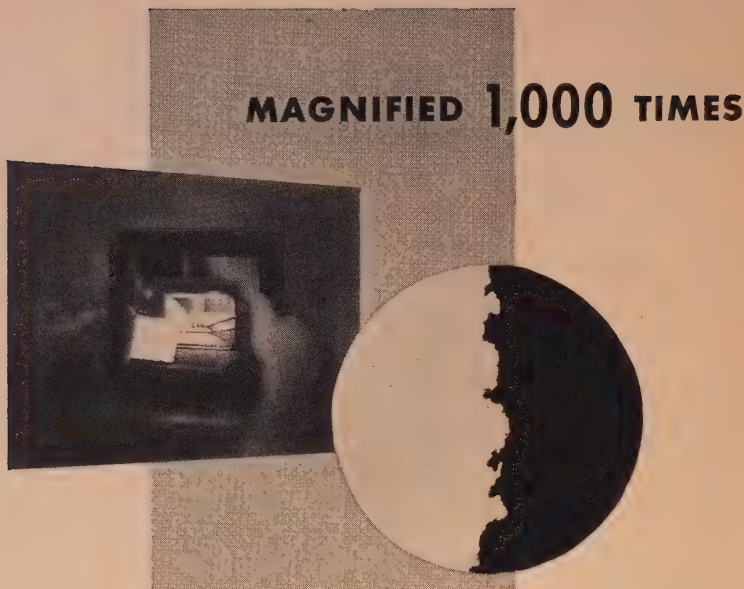
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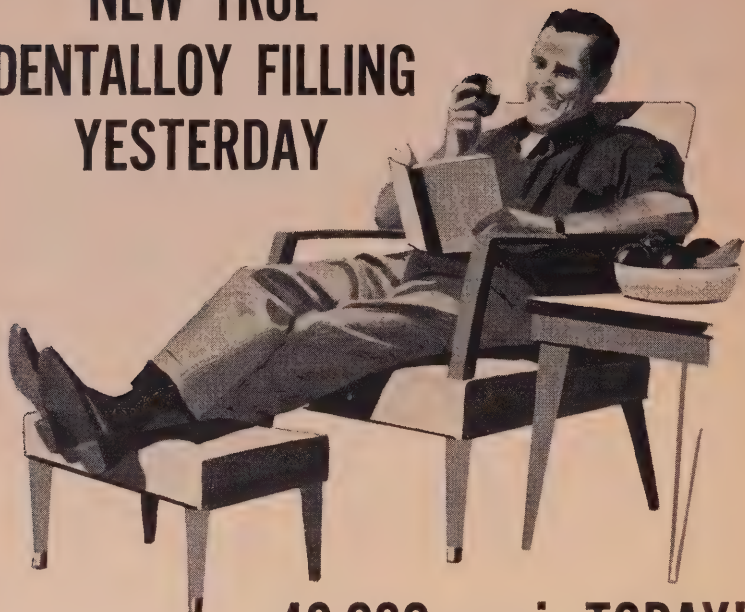
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2. Patrick D. Toto, D.D.S., M.S., Malburn Wilderman, D.D.S., M.S. and Charles Reeves, D.D.S.
Clinical Evaluation of an Oxygen Liberating Preparation Used Adjunctively in Root Planning.
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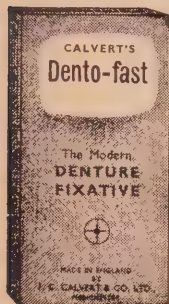
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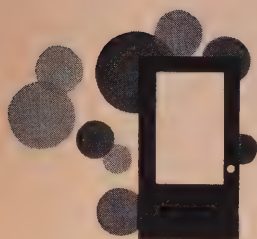
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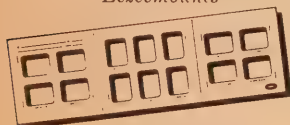
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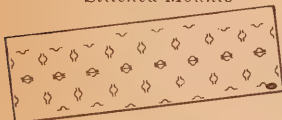
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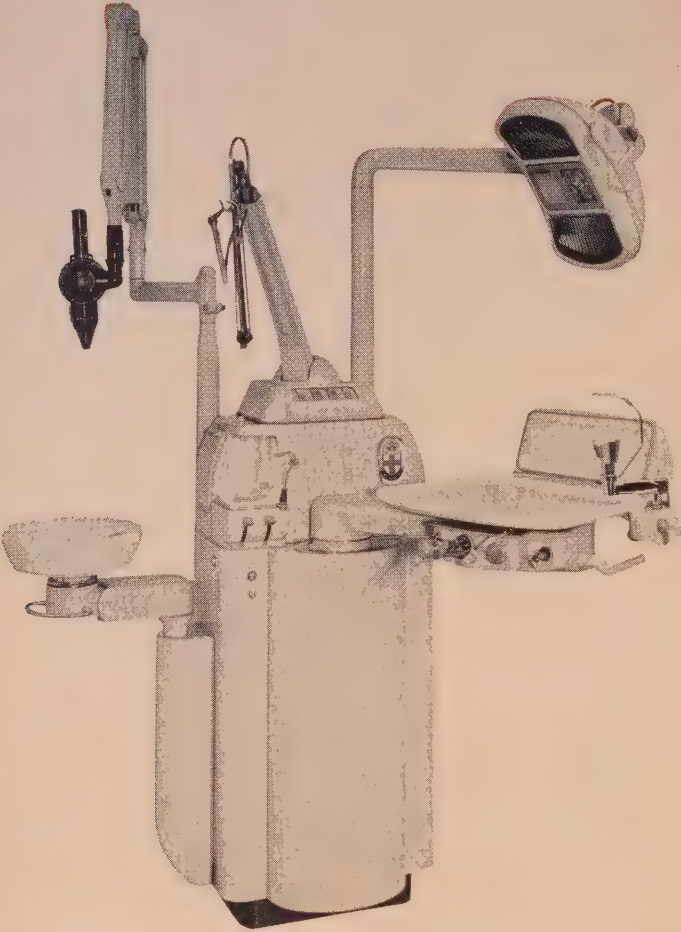
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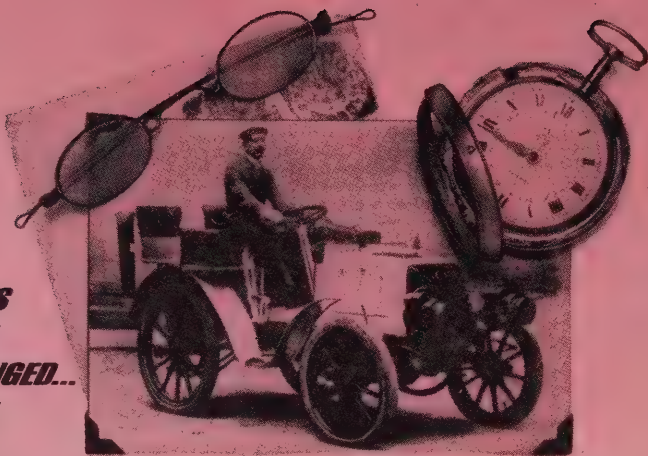
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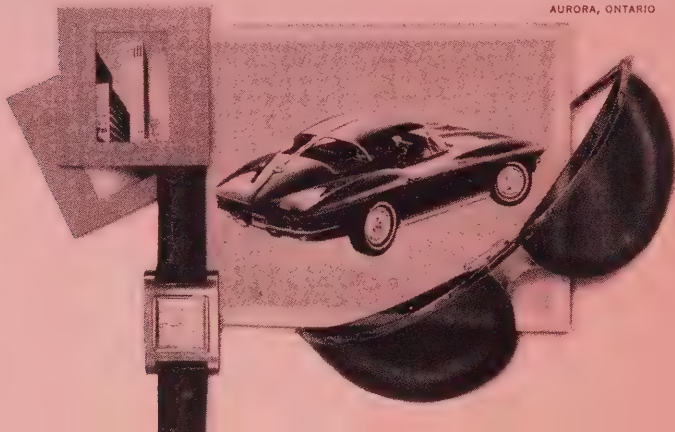
References: 1. Well, C., Welham, F.S., Santangelo, C. and Yackel, R. F. Clinical Evaluation of Mepivacaine Hydrochloride by a New Method, J.A.D.A. 63:26 July 1961. 2. Dobbs, E.C., and Ross, N. The New Local Anesthetic, Carbocaine, New York State D.J., 27:453 Nov. 1961. Other references to Carbocaine total 156; more papers in press. Available reprints on request.

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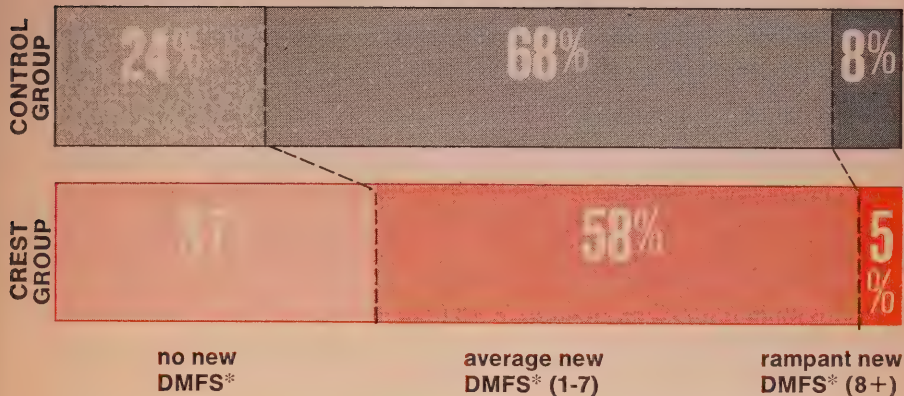
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*References: (1) Muhler, J. C.; Radike, A. W.; Nebergall, W. H., and Day, H. G.: J.A.D.A. 50:163, 1955. (2) Muhler, J. C.; Radike, A. W.; Nebergall, W. H., and Day, H. G.: J.A.D.A. 51:556, 1955. (3) Muhler, J. C., and Radike, A. W.: J.A.D.A. 55:196, 1957. (4) Muhler, J. C.: J.A.D.A. 64:216, 1962. (5) Personal Communication to Procter & Gamble.

***DMFS — DECAYED, MISSING, FILLED SURFACES**

See next page



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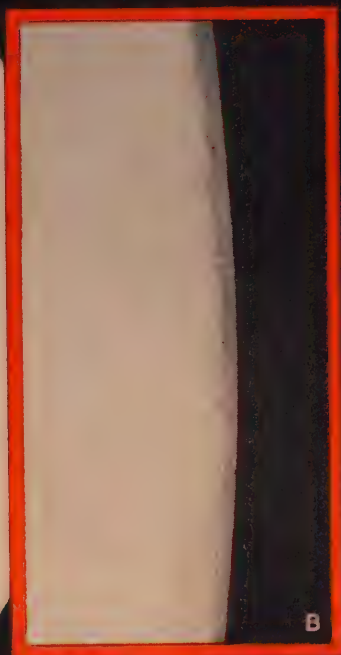
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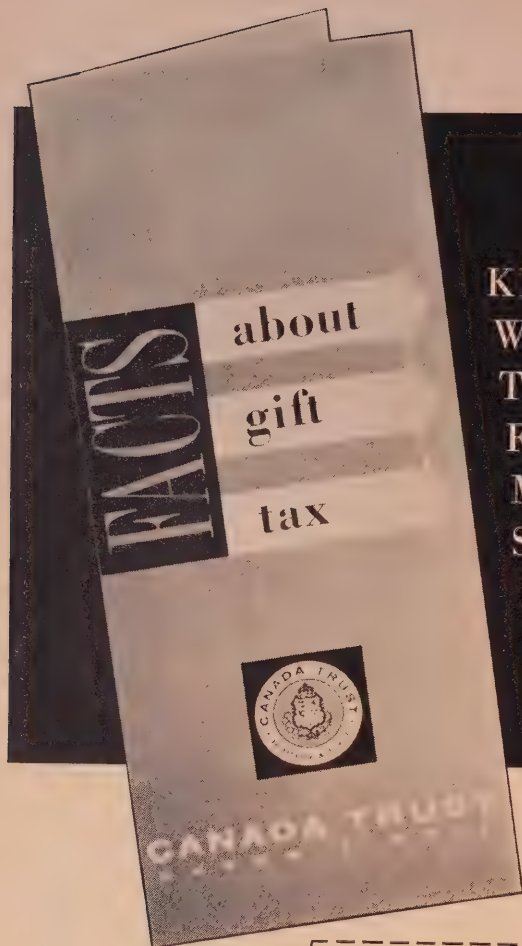
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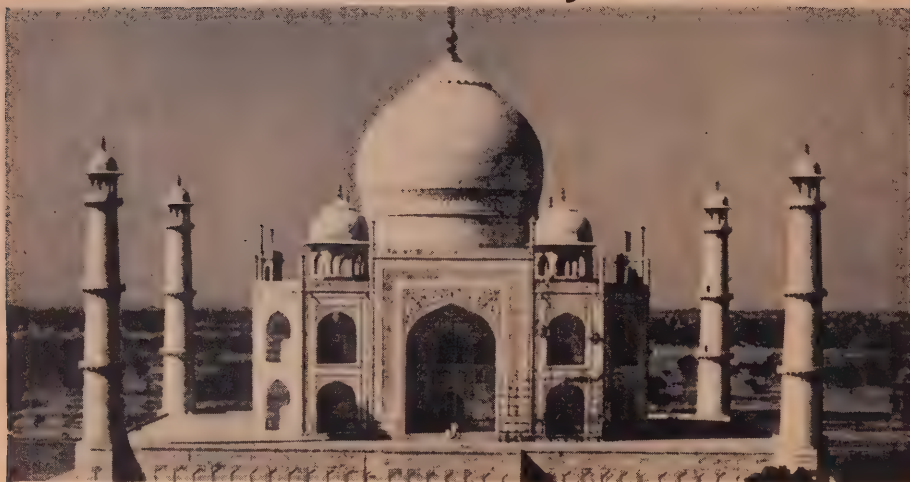
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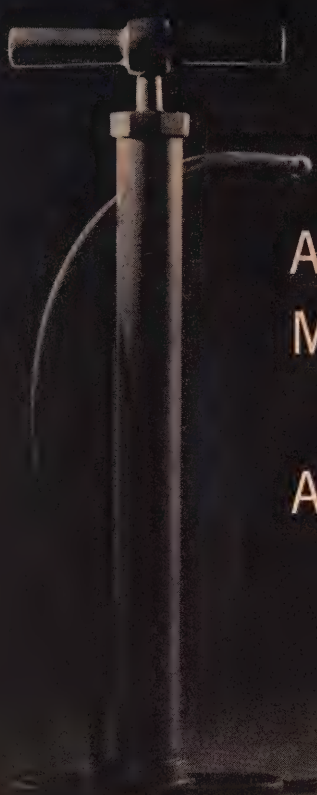
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Published monthly for the Canadian Dental Association by Gordon V. Allen Publications, 95 King Street East, Suite 205, Toronto, Ontario. Telephone 368-6251.

Gordon V. Allen, Advertising Manager.

Subscription price of Journal in Canada, Great Britain, the United States and all other countries, \$5.00 per year.

Authorized as Second Class Mail, Post Office Department, Ottawa, and for payment of postage in cash. All additions and changes of address should be sent to the Managing Director before the 20th of the month, to become effective the following month.

All expressions of opinion and statement of supposed fact are published on the authority of the author who submits them and do not necessarily express the views of the Canadian Dental Association, unless such statements or opinions have been adopted by the Association.

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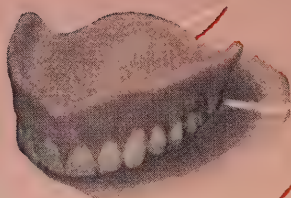
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The Canadian Dental Association

Volume 29

Number 4

Toronto

April 1963

JOURNAL

L'Association Dentaire Canadienne

Pain control in dentistry

Man's attempts to control the pain incident to surgical operations have a very long history. Pressure was used on nerves or blood vessels by the early Egyptian surgeons in order to cause insensibility in the part to be operated upon. The Assyrians were familiar with the anodyne and soporific effects of poppy and mandrake, and we know from Homer's *Odyssey* that the early Greeks alleviated mental and physical suffering by narcotic drinks. Attempts seem even to have been made by Graeco-Roman surgeons to produce what we now call carbon dioxide, to bring sleep by inhalation. And in the Americas, the early Inca knew the pain-relieving properties of extracts of coca leaves, using these to deaden the pain of trephining operations.

When one realizes that many primitive surgeons used crude instruments, one can well appreciate the yearning to get relief from the accompanying pain! And in fact many chemical agents with analgesic properties have been well known for more than two thousand years. Although their utilization may have been the exception rather than the rule, it must be remembered that early physicians had no means of assessing the potency of the extracts employed. And so the prudent surgeon, while acknowledging successes, was deterred by the numerous failures and disasters from using so uncertain a means of preventing pain.

How different is the story to-day! The development of modern chemistry has brought to the forefront a wide array of agents for the relief of pain and discomfort. Safe and effective if used in accordance with rational procedure, specific in their actions, and predictable in their results, these modern pharmacological agents are widely used to modify the threshold to pain and discomfort before, during and after surgical procedures of every kind.

Almost exactly paralleling the development of modern pharmacology has been the growing insight into the mechanisms that govern the reaction of the mind to the environment, and condition psychological responses to various stimuli, both real or implied.

Although as yet there is much which we comprehend only dimly or not at all, we possess sufficient knowledge which enables us to approach the problem of pain control in dentistry by rational means. A periodic review of every-day practice in this regard therefore seems appropriate. Such a review is presented in this issue of the Journal.

Premedication in dentistry

J. F. Reid, D.D.S., North Vancouver, British Columbia

In dentistry, premedication is therapy which is initiated before any dental operation. Premedication is planned to give the patient a maximum of comfort before and during any operative procedure and to reduce the number, severity and duration of postoperative sequelae and to assure greater efficiency and safety to that procedure.

The type of pain which is not conditioned by mental distress can generally be adequately controlled by a local anaesthetic. However, we must no longer be satisfied with eliminating pain in the operative field when we continually see patients upset, primarily, by apprehen-

sion. The dentist who does not consider the emotional attitude of the patient and take steps to make his dental appointments as pleasant as possible, is not providing adequate care for that patient.

It is certainly recognized that there are many advantages in premedicating a patient before commencing dental procedures. This does not mean, however, that routine medication should be employed. A diagnosis should be made, and then followed by a correct treatment plan. This treatment requires a knowledge of some appropriate drugs, the actions of each drug to be administered, and it can then be employed with maximum efficiency. Treating the cause is generally agreed to be the first consideration; nevertheless dentists are still most frequently

required to provide palliative treatment when it comes to fear and apprehension. It is to this particular facet of premedication that the emphasis of this paper is directed.

The manifestations of apprehension are numerous and assume many forms. One aspect may be identical with one patient on every visit to the dentist. In other persons, the form may be quite different. With some, there may be absence of any sign at all. In these latter cases, however, the patient anticipates the eventuality of pain to such a degree, that the first sound of the high-speed handpiece will 'feel' painful. Add this to the various organic manifestations such as increased blood pressure, rapid heart beat and/or difficult breathing and it is apparent a serious risk is created for some patients.

Recognizing, then, the situation, we must employ all the tools at our disposal to dispel it. An attractive waiting room with soft background music, a pleasant receptionist, a time schedule that does not keep the patient waiting are some obvious aids. On the part of the dentist must be shown confidence, gentleness and sympathy. To this add premedication followed by accepted dental procedures, and complete treatment will surely be the result.¹

BARBITURATES

Advantages for clinical use. — Barbiturates² have become widely used as sedative and hypnotic drugs owing to a number of advantages. Through the proper selection of the drug, dose and route of administration, any degree of depression may be provided. Barbiturates can be given orally, rectally, intravenously or intramuscularly. They do not disturb the vital functions of the body in recommended doses and they are easily dispensed in palatable form.

Pharmacology.—Barbiturates are in general, central nervous system depressants. Oral administration of hypnotic doses of

barbiturates is usually followed by a slight slowing of respiration. There is no significant change in circulation, the blood constituents are not affected in moderate doses and there is no appreciable change in blood sugar concentration.

With medication sufficient for light hypnosis, there is no significant depression in the metabolic rate. Sedative and hypnotic doses lower the body temperature slightly. Kidney function is not seriously affected by barbiturate medication and hepatic function is unimpaired by therapeutic doses.

Routes of administration and elimination.

— For dental use, the oral route is the most common. Rectal administration may be indicated in patients who do not tolerate drugs orally or in young paedodontic patients.

The body eliminates barbiturates in two ways — by excretion through the kidneys and by destruction in the liver. The longer acting compounds, such as phenobarbital, depend to a greater extent upon the kidneys for elimination, which probably accounts, in part, for their prolonged effect. Destruction in the liver is the basis for the brief effects of the shorter acting barbiturates. The disposition of these drugs should be kept in mind when selection for sedative or hypnotic medication is made.

Dosage, onset of action, and duration of effect. — Barbiturates may be classified according to the order of onset and duration of action (Table 1).

Toxic effects.—Toxic reactions may occur as a result of overdosage or of individual susceptibility to the drug, but death from sedative or hypnotic doses is practically unknown.

Hypersensitivity may occur and is usually characterized by excitement, hyperpyrexia or skin eruptions. However, such occurrences are rare.

Correct selection is imperative in patients with advanced cardiovascular-

TABLE 1 Classification of barbiturates.

Type	Onset (minutes)	Duration (hours)	Average sedative dose	Average hypnotic dose	Name
Short-acting	15 - 30	5 - 7	$\frac{3}{4}$ gr.	$1\frac{1}{2}$ gr.	sodium secobarbital (Seconal)
Moderate-acting	30 - 45	8 - 11	1 gr.	3 gr.	sodium pentobarbital (Nembutal)
					sodium amobarbital (Sodium Amytal)
Longer-acting	45 - 60	11 - 14	$\frac{1}{4}$ - $\frac{3}{4}$ gr.	$1\frac{1}{2}$ - 3 gr.	amobarbital (Amytal)
Long-acting	60	10 - 16	$\frac{1}{4}$ - $\frac{1}{2}$ gr.	$1\frac{1}{2}$ - 3 gr.	phenobarbital (Phenobarbital)

renal disease (use short-acting) or impaired liver function. (use long-acting)

Debilitated patients and those of advanced age may respond more profoundly than younger people. In this case smaller doses are indicated. Fatal doses can only be established from accidental or suicidal ingestion of too large doses. Fifteen times the usual dose is considered lethal. There is, in reality, a wide range of safety in the administration of barbiturates.

Disadvantages.—Patients under barbiturate medication require supervision when proceeding to and from the office due to a dulling of the reflexes. Habituation may also be a problem. Furthermore, a so-called 'hangover' may follow administration.

TRANQUILLIZERS

In the last few years, wide interest has been shown by the dental profession in these pharmacological agents which, in therapeutic doses, allay apprehension without producing deep sedation. Despite this interest, a review of the dental literature fails to produce many detailed evaluations.

On the basis of their chemical structure, they may be classified into five groups of compounds:³

1. Phenothiazine group. — This includes

compounds of the phenothiazine type, e.g. chlorpromazine (*Largactil*, Poulenc). They are chemically related to the anti-histamine drug promethazine (*Phenergan*, Poulenc) which itself has some ataractic activity.

2. Rauwolfia alkaloids. — This includes formulations of reserpine, the active principle of the Rauwolfia root, e.g. *Serpasil* (Ciba) and *Alserin* (Frosst).

3. Diol group. — e.g. meprobamate (*Miltown*, Ayerst) and (*Equanil*, Wyeth).

4. Diphenylmethane group. — e.g. hydroxyzine HCl (*Atarax*, Pfizer).

5. Azepine group. — e.g. benzodiazepine (*Librium*, Roche).

Although these groups differ widely in their main pharmacological actions, they all produce a tranquil state in varying degrees, without sedation or hypnosis. The mechanism of their action has not been clearly established.

Dobbs et al⁴ report a study on chlorpromazine in 25 mg. doses, and conclude that it may be a useful aid in the control of problem paedodontic patients. They discovered, however, that it is not without some undesirable side effects such as mild fever, dry mouth, nasal congestion and/or constipation.

The Council on Dental Therapeutics of the American Dental Association has expressed the opinion that the Rauwolfia alkaloids are generally unsuited to dental

use because of the long period of administration required to obtain therapeutic effects.

Early reports on meprobamate were encouraging but more extensive clinical investigation indicates a lack of effectiveness together with a number of undesirable side effects.

Some excellent clinical studies have been done on the diphenylmethane group. Protell⁵ in a study of 216 patients found hydroxyzine HCl to be a good, mild tranquilizer which does not impair psychic function and is therefore especially suited to ambulatory patients. It is practically devoid of side effects. The drug is extremely well tolerated and has a rapid onset of action. The individual dose in some cases had to be adjusted to the proper degree, since individual requirements did not seem to depend on the age, sex or body weight, but rather on the severity of the emotional upset. It had better results on females (90 per cent) than on males (81 per cent). The most notable effect exhibited by hydroxyzine was a state characterized by lower nervous and psychic tension followed by tranquillity and peace of mind.

Abramson,⁶ in a study of 250 dental patients showed uniformly satisfactory results. Of particular interest was the rapidity of onset (5-10 minutes) using the syrup. The usual dose for full effect was 25 mg.

Benzodiazepine has been introduced to the dental profession recently, and early results indicate that its ataractic effects may be of use in dental practice. However, it would appear too early to appraise as yet.

In summing up the tranquilizers for use in dentistry, the following conclusions can be drawn:

Their advantage is the difference between the central effects of these drugs and the barbiturates. Evidently the ataraxics act below the level of the cortex while the barbiturates depress the cerebral cortex. The evidence is to be found in the metabolic depression of cortical tissue in the presence of barbiturates, which

does not occur with the tranquilizers. The greater tendency of effective doses of the barbiturates to produce drowsiness and confusion is evidence of the same quality.

Some disadvantages are that many ataraxics require prolonged administration for desired effects; some are allergenic and sometimes quite toxic. One must prescribe, therefore, only those that have been investigated thoroughly.

OTHER DRUGS THAT ALLAY APPREHENSION

Meperidine.—In clinical use, meperidine HCl (*Demerol*) produces mild sensory and motor sedation and is suggested as a preoperative sedative.⁷ This action is due to a depressive influence on the cerebral cortex. It is rapidly absorbed, being effective in twenty to thirty minutes. It is detoxified by all tissues, and no reports of chronic effects on circulation, respiration, blood or liver function have been noted. Meperidine by its euphoric action may produce habituation. Its use requires that the patient be supervised. Its effect is potentiated by the barbiturates.⁸

Belladonna alkaloids.—Atropine and scopolamine act on the central nervous system and block the parasympathetic nervous system peripherally. Atropine is used as a premedicant in dentistry for its inhibition of saliva where this may interfere with the dental operation to be performed. The dose is gr. 1/120-1/50 one-half to one hour before treatment. Scopolamine is often given as premedication because it produces drowsiness, euphoria and amnesia. Album^{9,10} uses these drugs on handicapped children, but their use in dentistry is not generally practised.

Choral hydrate.—Before the advent of the barbiturates early in the present century, chloral hydrate was the most frequently used hypnotic.¹¹ It provides, in doses of gr. 7½-10, a rapid, effective sedation without so-called 'hangover' and the patient awakes refreshed. It is one

of the safest of all sedatives. With the recommended dosage, preliminary excitement is rare, and tolerance and cumulation are unlikely. Contributing to its disuse in past years was its unfortunate taste. However, this can be completely masked in a pleasant syrup containing gr. $7\frac{1}{2}$ of chloral hydrate per teaspoonful (*Noctec*, Squibb), and it is being used more and more in dental medication.

The use of chloral hydrate is synergistic with the tranquillizing drug, hydroxyzine, and when the syrups of chloral hydrate and hydroxyzine are mixed in equal parts and administered in doses of two teaspoonfuls, fifteen minutes before the dental appointment, effective results have been demonstrated in relieving the anxiety and tension states of paedodontic patients.

SUMMARY

The elimination of patient apprehension constitutes the main reason for the administration of premedication by the dentist in general paedodontic practice.

The safest and, therapeutically, the most desirable method of treating apprehension is psychological, for elimination of the cause is the first order of treatment. However, lack of training in this field and the time required per patient sometimes leads us to treat the symptoms rather than the cause. For this purpose there are drugs which will help many patients, and dentists, over the problem of tension and anxiety.

The barbiturates have been the most widely used drugs as dental premedicating agents. In correct doses, they depress the cerebral cortex, manifestations of apprehension subside and patients become co-operative. This is not accomplished without some risk, and a case history should be taken. The normal amount of depression which these drugs create makes patient supervision to and from the dental office mandatory.

Tranquillizing drugs, when properly

chosen, appear to do what the barbiturates do but without sedation or hypnosis. Several good studies have been done with hydroxyzine, demonstrating that single doses, especially in syrup form, can be effective for dental patients.

Chloral hydrate appears to be taking its place again as a safe, efficient sedative. Of special note is its potentiation with hydroxyzine.

From the patient's standpoint, comfort during a dental procedure is a situation without pain or other unpleasant stimuli, surrounded by a state of relaxation. Premedication is a valuable aid in creating such a situation for the apprehensive patient.

RÉSUMÉ

Le dentiste, quand il donne une pré-médication aux adultes et aux enfants, a surtout comme objectif d'atténuer l'apprehension des traitements qu'il va prodiguer. La psychologie constitue la plus sûre et la meilleure méthode d'éliminer la crainte des traitements dentaires et elle doit être mise en oeuvre en tout premier lieu. Cependant, le manque de connaissances dans cette science et la durée de temps qu'elle exige portent le dentiste à traiter les symptômes plutôt que la cause. Il y a, pour ce faire, des médicaments qui aident les patients et les dentistes à solutionner les problèmes de tension et d'anxiété nerveuses.

Les barbituriques sont les agents les plus employés. Les doses ordinaires dépriment le cortex cérébral, atténuent les signes d'apprehension et créent chez le patient un esprit de collaboration. L'administration de ces médicaments comporte toutefois un certain risque et, avant de les donner, il faut établir une histoire de cas. L'action dépressive de ces médicaments oblige le patient à se faire accompagner pour se rendre chez le dentiste et en revenir.

Les tranquillisants, quand ils sont choisis à bon escient, donnent les mêmes

résultats que les barbituriques, mais sans occasionner de sédation ou d'hypnose. Des recherches entreprises sur l'hydroxyzine ont montré qu'une seule dose—sous forme de sirop—a de bons effets chez le patient qui subit des traitements dentaires.

L'hydrate de chloral semble reprendre son rang comme sédatif efficace et sûr. Il faut noter les effets bienfaisants de son association avec l'hydroxyzine.

Le patient, quand il est détendu au cours d'un traitement, n'éprouve pas de douleur et il ne réagit que peu aux manipulations désagréables. La prémédication est un adjuvant précieux pour obtenir ces résultats chez un patient nerveux.

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Local anaesthetics in dentistry

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The fear of pain as well as pain per se are major factors which influence the patient-dentist relationship. Further, the dentist, with the use of mechanical aids, sometimes finds it necessary to operate on tissues that are acutely inflamed and exquisitely sensitive.

The immediate pre-operative prophylaxis of pain is one of the major objectives of the dental practitioner, and there seems to be general agreement that effective regional block with the use of local anaesthetic agents can in most cases provide

reliable protection against the pain associated with various dental procedures.

At the turn of this century, the German chemist Einhorn synthesized procaine.¹ Since then several hundred compounds have been synthesized in the search for a more nearly ideal local anaesthetic, whose properties (among others) should include a rapid onset of action, stability, compatibility with vasoconstrictor agents, increased potency, a wide margin of safety, and a minimum of undesirable reactions. None of the currently available local anaesthetics fulfil all of these criteria. However, active investigation will undoubtedly continue to make progress in the direction of these desiderata. In the interim, however, it should be borne in mind that constant consideration of these criteria should be the basis for a rational

This paper was presented in part at the Annual Meeting of the Canadian Dental Association, Vancouver, June 5, 1962.

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selection from among the many compounds which are continually being introduced for the production of dental anaesthesia.

The majority of local anaesthetics in clinical use are characterized chemically by having a hydrocarbon residue (usually a benzene ring) at one end of the molecule and an amino group (usually a secondary or a tertiary amine) on the other, separated from each other by a varying number of carbon atoms.^{2,3} The hydrocarbon residue is lipophilic or fat-soluble, while in contrast the amino group is hydrophilic or water-soluble. By virtue of the tertiary nitrogen, local anaesthetics are relatively basic, and as such react with acids (usually HCl) to form stable and water-soluble salts.

When injected into the tissues as the acid salt, the local anaesthetic reacts with the bicarbonate of the tissue to liberate the free base, which is then able to penetrate the membrane of the neurone and become ionized within the nerve fibre. In its ionized cationic form the local anaesthetic is a quaternary ammonium derivative and as such blocks nerve transmission by interfering with the ionic processes necessary for the propagation of the excitation wave along the nerve fibre.

The observations cited above have certain basic implications. Changes in the pH of the tissues can alter the effectiveness of an injected anaesthetic. Thus, if the pH is acid (e.g. in inflammatory processes) less free base is formed, penetration of the nerve membrane is delayed, and it is difficult to achieve reliable and effective regional anaesthesia.³

Another important factor which governs the effectiveness and in some circumstances the toxicity of local anaesthetics is the rate of diffusion of the compound into the capillaries from the injected site, and its removal by the blood. Rich vascularity of the injected site may facilitate rapid absorption of the anaesthetic, high concentrations may be carried in the blood to the central nervous system and heart, and systemic toxic reactions may occur.⁴ In contrast, if the anaesthetic is

quickly removed from the site of injection or inactivated rapidly, concentrations essential for adequate anaesthesia and smooth operative procedures cannot be achieved.

These difficulties are further complicated by the observation that most local anaesthetics produce vasodilation at the site of injection. The incorporation of vasoconstrictors such as adrenaline (epinephrine), phenylephrine (Neo-Synephrine), and nordefrin (Cobefrin) into solutions of local anaesthetic agents has been of value not only for the achievement of sufficient depth and duration of anaesthesia locally, but also in reducing the incidence of systemic toxic reactions, and in minimizing haemorrhage from the operative field.⁵

There is no doubt that toxic reactions may be caused by vasoconstrictors, but these reactions are seen to occur only when blood concentrations are greatly elevated (as from a direct intravenous injection) or, more rarely, when the patient is unusually sensitive to one of these adrenergic agents.

In addition, there has been deep concern and controversy among dentists regarding the incorporation of adrenaline and its congeners into solutions of local anaesthetics for use in patients with cardiovascular disease.^{6,7} In this circumstance, consultation with the patient's physician is a primary consideration. The New York Heart Association has stated that under proper conditions, the use of adrenaline with local anaesthetics (procaine) for dental surgery presents no special hazards in persons with heart disease.⁸ Furthermore, attention is directed to clinical studies in which it has been demonstrated that pain and the reaction to pain which may accompany inadequate blockade, such as may be produced in the absence of a vasoconstrictor, will induce the secretion of endogenous adrenaline in quantities much larger than those which may have been supplied by the administration of a local anaesthetic with a vasoconstrictor.⁸⁻¹³

New information which appears to have

a bearing on the effectiveness of local anaesthetics, has also emerged from the recent investigations of Condouris¹⁴ and Condouris and Kiraly.¹⁵ These investigators have presented evidence which indicates that some of the so-called anaesthetic failures might be attributable not to the inability of the dentist to "hit" the intended nerve with the drug, but rather to failure in applying the local anaesthetic to an adequate length of nerve. Condouris has stressed the view that local anaesthetics may raise the threshold for excitation by competing with sodium for a cellular site with which sodium interacts in a critical manner. Successful competition increases the threshold of the nerve fibre, decreases the size of the spike or nerve impulse, and depresses excitability. He has shown further that when a normal impulse travels along a nerve and reaches an area treated with a local anaesthetic, the intensity of this impulse (maximal spike) decreases progressively along the length of the anaesthetized segment, until, at some point in that segment, the impulse is extinguished and conduction is blocked. In contrast, when the anaesthetized segment is shorter in length, the impulse does not decrease to the point of extinction but retains sufficient magnitude so that, on approaching an unanaesthetized area this modified impulse is able to reactivate a propagated all-or-none response distal to the site of injection. These studies attempt to explain the phenomenon which has been referred to as "jumping the block," as well as certain forms of paraesthesias (such as burning, itching, and tingling) reported by patients during the course of dental anaesthesia. The possibility that these abnormal sensations may, in certain instances, be caused by other factors, such as an existing pathological state of trauma, may be difficult to exclude. However, the observation that these sensations often have been reported only during the induction of local anaesthesia, and before the initiation of any operative procedures, strongly suggest the possibility of a causal relation-

ship between the local anaesthetic and the reported phenomena.

Other forms of toxicity also may emerge either as an allergic reaction, or as the result of the accidental direct intravascular injection of the anaesthetic agent.

Since some forms of toxicity bear a relationship to the structure of local anaesthetics, it is of interest to consider briefly the chemical differences of those compounds which are in use clinically. From the point of view of their toxicity, such compounds may be classified into two groups, the esters of benzoic acid and the non-esters.

Benzoic acid esters.— To the benzoic acid group of esters, of which procaine is the most well-known member, belong butethamine (Monocaine), propoxycaine (Ravocaine), 2-chloroprocaine (Nesacaine), metabutethamine (Unacaine), meta-butoxycaine (Primacaine), 2-isobutylamino-2-methyl propyl benzoate (Kinacaine) and meprylicaine (Oracaine). These ester-type local anaesthetics are hydrolyzed by human plasma cholinesterase, the rate of hydrolysis varying with the chain length of the alcoholic component and/or the type of substitution on the benzoic acid nucleus. Thus, chloroprocaine HC1 (Nesacaine), which differs from procaine by the presence of a chlorine atom in place of hydrogen on carbon 2, is hydrolyzed more rapidly than procaine, and is reported to be less toxic than the parent compound.^{16,17}

Non-esters.— In contrast the non-ester type of local anaesthetics lidocaine (Xylacaine), mepivacaine (Carbocaine), cinchocaine (Nupercaine), hostacaine¹⁸ and L67¹⁹ are not hydrolyzed by plasma cholinesterase. These compounds are characterized by having an amide linkage, and it appears that they are either excreted unchanged or undergo partial metabolic degradation in the liver.

The chemical dissimilarities between lidocaine and mepivacaine on the one hand, and the procaine-type compounds on the other, have important clinical implications. Allergic responses to procaine

or its derivatives may occur as a result of previous sensitization to benzoic acid esters through the use of ointments, sunburn preventatives and throat lozenges which contain benzocaine.^{20,21} In such circumstances the possibility of a severe allergic toxic reaction then precludes the use of procaine and its congeners, and lidocaine or mepivacaine may be tried instead. However, regardless of the local anaesthetic which may be used, one should always be on the alert for the development of severe untoward reactions even in the absence of allergy. These may range from syncope to a generalized systemic reaction characterized either by cardiovascular and/or respiratory collapse, or by central manifestations of pallor, restlessness, tremor, and convulsions. In these circumstances the establishment of an adequate airway and the maintenance of pulmonary ventilation, with the patient in Trendelenburg's position, are primary considerations. The importance of prompt and efficient oxygenation cannot be overemphasized. Reactions must be treated immediately and competently and this can only be achieved effectively if the dentist and his office colleagues are well acquainted with the modern principles and practices of treating respiratory and circulatory emergencies.¹⁷

It is anticipated that future research will provide the dental profession with more effective and safer local anaesthetics. At present, however, there is no compelling evidence to indicate that one compound is vastly superior to any other, especially when all parameters of local anaesthetic action are critically examined. The important point to bear in mind is to get to know a local anaesthetic well, — know its advantages and its limitations, and use an agent whose application has consistently produced effects which are best suited to your type of procedure.

RÉSUMÉ

Un anesthésique local idéal devrait avoir les qualités suivantes: rapidité d'in-

duction, stabilité, compatibilité avec les agents vaso-constricteurs, action profonde, marge considérable de sécurité et minimum de réactions ennuyeuses. Aucune des solutions anesthésiques qui sont sur le marché a toutes ces propriétés.

La majorité des anesthésiques locaux ont un résidu d'hydrate de carbone (habituellement de la chaîne du benzène), à un bout de leur molécule, et un groupe amino (d'ordinaire une amine secondaire ou tertiaire), à l'autre bout; ces deux fins de molécule sont unies au centre par un certain nombre d'atomes de carbone. Le résidu de carbone est soluble dans les graisses, tandis que le groupe amino est soluble dans l'eau. Les solutions anesthésiques, à cause de leur azote tertiaire, sont plutôt des bases et, comme telles, elles se combinent aux acides pour former des sels stables et solubles dans l'eau.

Les solutions anesthésiques, quand elles sont injectées dans les tissus sous forme de sels acides, réagissent avec le bicarbonate des cellules pour libérer la base libre, qui peut alors pénétrer la membrane des neurones et s'ioniser avec les fibres nerveuses. L'anesthésique local, dans sa forme catonique ionisée, est un dérivé quaternaire de l'ammonium et, comme tel, il bloque les transmissions nerveuses en s'opposant au processus ionique nécessaire pour la propagation de l'excitation, le long de la fibre nerveuse.

Les changements qui se produisent dans le pH des tissus peut influencer l'effet de la solution anesthésique, quand elle est injectée. Ainsi, si le pH est acide (p.e., en présence d'inflammation) il y a moins de base libérée, retard dans la pénétration de la membrane de la cellule nerveuse et anesthésie moins sûre et moins profonde.

Le taux de la diffusion du composé dans les capillaires de la région injectée et son élimination par le sang règle l'efficacité et parfois la toxicité des anesthésiques locaux. L'incorporation de vaso-constricteurs, tels que l'adrénaline, aide à contrôler la vaso-dilatation que produisent les anesthésiques locaux à l'en-

droit de l'injection et diminue l'incidence des réactions toxiques et diminue l'hémorragie du champ opératoire.

L'emploi de l'adrénaline dans les solutions anesthésiques, selon la New York Heart Association, n'offre pas de danger particulier pour les patients qui souffrent du cœur et qui ont à subir une intervention de chirurgie dentaire. On a même prouvé que la douleur et la réaction à la douleur qui accompagnent une anesthésie superficielle, comme celle obtenue avec des solutions qui ne contiennent pas d'agent vaso-constricteur, stimule une sécrétion interne d'adrénaline dont la quantité dépasse celle qui est injectée en utilisant une solution contenant un vaso-constricteur.

Les échecs au cours de l'anesthésie sont attribuables surtout au fait que la solution n'est pas déposée sur une longueur suffisante d'un tronc nerveux plutôt que de ne pas l'injecter à l'endroit exact. L'intensité d'une réaction qui se propage normalement le long d'une branche nerveuse diminue progressivement quand cette réaction atteint une zone insensibilisée et elle s'atténue jusqu'à disparaître complètement: la conduction est alors bloquée. Par ailleurs, quand la branche nerveuse est plus courte, la réaction ne diminue pas au point de disparaître; elle conserve assez d'ampleur pour que, quand elle approche une région qui n'est pas anesthésiée, elle peut se réactiver et provoquer plus loin que l'endroit de l'injection une sensibilité dans la région distale.

On peut classer les solutions anesthésiques, au point de vue toxicité, en deux catégories: (1) l'éther de l'acide benzoïque (procaïne, butethamine, propoxycaïne, etc.) et (2) la non-éther (lidocaïne, mépivacaïne, etc.). Les solutions anesthésiques du genre éther sont hydrolysées par la cholinestérase du plasma humain; le taux de l'hydrolyse varie selon la longueur de la chaîne des composés d'alcool et/ou selon le genre de substitution du noyau d'acide benzoïque.

Les solutions du genre non-éther ne sont pas hydrolysées par la cholinestérase du plasma. Ces composés se caractérisent par le fait qu'ils ont une relation amide; ils sont excrétés soit intacts ou ils subissent une légère décomposition métabolique dans le foie.

Des réactions allergiques à la procaïne ou à ses dérivés peuvent se produire à la suite d'une sensibilisation aux éthers de l'acide benzoïque par l'usage d'onguents, de pommades contre les coups de soleil ou de losanges pour la gorge qui contiennent de l'acide benzoïque. Il vaut mieux alors, pour prévenir des réactions allergiques graves provenant de la procaïne et de ses dérivés, utiliser la lidocaïne ou la mépivacaïne.

Le dentiste, peu importe la marque de solution anesthésique qu'il emploie, devrait toujours se méfier des réactions rebelles, même non allergiques. Ces réactions peuvent osciller entre une syncope et une manifestation générale de tout l'organisme, soit par une défaillance cardiaque ou un arrêt de la respiration, soit pas des signes de pâleur, d'énervement, de tremblements ou de convulsions. Il faut, dans ces cas, faciliter la respiration et maintenir la ventilation pulmonaire, en plaçant le patient dans la position de Trendelenburg. On ne peut trop appuyer sur la nécessité d'une oxygénation suffisante.

On ne peut pas actuellement se prononcer au sujet de la supériorité d'une solution sur une autre. Il est important de bien connaître la solution qu'on utilise, de savoir ses avantages et ses limites et utiliser un agent qui donne un rendement qui convient aux besoins.

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The place of general anaesthesia in dental practice

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"CHILD DIES UNDER ANAESTHETIC IN DENTAL CHAIR!" "SUDDEN DEATH IN DENTIST'S OFFICE!" Glaring headlines in city newspapers; sensational reading; bereaved and shocked parents; a home wrecked through the loss of a mother or father.

Such incidents have occurred in Canada during the past years. There will always

be tragedies associated with surgery and anaesthesia. However, we, as physicians and dentists, must use all available means to reduce the incidence of these unfortunate events.

General anaesthesia for dental surgery in children and adults is a necessity, and can be conducted with minimal risk provided certain standards are set and adhered to when establishing such a service.

The authors plan to discuss their own experiences and those of their associates over a ten-year period, and bring forward certain recommendations.

On the evening of December 10, 1844, a group of residents of Hartford, Connecticut attended a touring medical side-

Presented at the Annual Meeting of the Canadian Dental Association, Vancouver, June 5, 1962.

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show, billed as "A Grand Exhibition of the Effects Produced by Inhaling Nitrous Oxide, Exhilarating or Laughing Gas — by Gardner Quincy Colton."

In the audience was a young dentist, Horace Wells, who noted the complete indifference with which one of the subjects of the demonstration treated a badly bruised shin while under the influence of nitrous oxide. The next day Colton was invited to administer nitrous oxide to Dr. Wells while a colleague, Dr. Gibbs, extracted a tooth. Wells was impressed with the comfort of the extraction under anaesthesia, and began to apply the method to his patients. In February of 1845, allowing for a very scanty clinical experience, Wells attempted to anaesthetize a patient publicly at the Massachusetts General Hospital. This demonstration was regarded as a complete failure because the patient moved and made a slight sound as the tooth came out. He later admitted to feeling no pain. (Today, in the modern operating theatre, with highly trained and experienced administrators of drugs much more potent than Wells' nitrous oxide, we occasionally witness the same somewhat distressing phenomenon!) Almost two years later, on October 16, 1846, William Henry Morton, partner in Wells' dental practice, demonstrated successfully the administration of ether for a surgical operation and modern anaesthesia was on its way—very much in debt to the stimulus of two dental surgeons.

Advances in pharmacology and physiology have produced a number of locally acting anaesthetic drugs which make it possible to operate in the mouth with comfort and safety under regional anaesthesia. However, many patients, for well recognized medical reasons, are better cared for under general anaesthesia when major oral operations are being done — patients with heart disease, pulmonary disease, certain nervous system disorders, blood dyscrasias, haemophilia—to suggest a few. It has been generally considered wise to admit these poor risk patients to hospital for dental surgical procedures.

It is still a fact that most dental surgical procedures are accomplished with "comfort and safety" under regional anaesthesia. The quotation marks are our personal reservations that at times the comfort and safety are relative — depending on both the dentist and the patient. It is our opinion that a large number of dental patients who do not qualify as "medically indicated" for general anaesthesia, can and do benefit from having oral surgery performed while unconscious. In our own practice we have two main groups: children who require more or less extensive dental reparative programs, and adults and children who require multiple extractions. We propose to discuss each of these groups in some detail.

DENTAL ANAESTHESIA FOR THE HOSPITALIZED CHILD

The partnership of which we are members, is responsible for the anaesthetic services at Children's Hospital in Vancouver, B.C. Some ten years ago, the Dental Department of that hospital requested our co-operation in a program aimed at dental rehabilitation of children who while awake, were, for one reason or another, unable to co-operate with the dentist.

These children may be categorized as follows:

1. mentally retarded children
2. spastic children
3. psychologically unco-operative children
4. children with multiple carious lesions requiring many sessions if repaired with the child awake.

Our original experience was with the spastic and retarded children, and when our dental colleagues realized that the method could be applied successfully to classes 3 and 4, the emphasis was shifted to these children.

The majority of these patients are between 3 and 8 years of age, and our oper-

ating time averages 60 to 120 minutes. These children are admitted to hospital the night before surgery and discharged the morning after surgery. Our case load has increased gradually over the years, and at the present time we are booked every afternoon, Monday through Friday — approximately 500 cases per year.

The anaesthetic management of these children deserves mention in detail. In order to avoid unnecessary admissions and last minute cancellations, the children are checked by their paediatrician before coming to hospital. This excludes temporary contraindications to surgery, and ensures a satisfactory medical status.

Many of these children are difficult to manage while awake. Substantial premedication is necessary, usually a combination of barbiturate, morphine and hyoscine. Due to the use of high and low-speed drills in the mouth, a non-explosive anaesthetic agent is an absolute requirement. Agents actually used vary with the individual anaesthetist — nitrous oxide, with or without trichlorethylene, halothane or chloroform.

In accordance with our general principles of anaesthesia in children or adults, endotracheal anaesthesia in surgery about the head and mouth is another "sine qua non" — and in these cases the endotracheal tube is always inserted nasally, but under direct vision, to ensure that the proper sized tube is used. As the tube passes through the nose, the dentist has full access to each of the four quadrants of the mouth. The dentist cannot interfere with the airway, nor will the airway interfere with him.

Maintenance of anaesthesia in the age group with which we are dealing is always with a non-rebreathing system, using one of the common valves. One of the short-acting relaxant drugs is administered to allow an easy atraumatic intubation. Local anaesthetic spray is frequently used on the vocal cords to allow a lighter plane of anaesthesia.

A major contribution to the safety of the child is the monitoring of heart and chest by the precordial stethoscope. This

constant auscultation of the heart and lungs ensures a constant knowledge that heart action is normal, and also diagnoses the occasional accidental endobronchial intubation and permits of its instant correction.

Movement of the head is avoided during surgery by the use of a suitable doughnut. At the termination of surgery, extreme care is taken that all tooth powder, amalgam particles and other debris are removed from the mouth; that all extraction sockets are dry, and any debris is removed from the stretcher so that corneal abrasions are avoided in the recovery period. The surgery is performed with the patient lying on the original stretcher which brought him to the operating room. He is returned to the recovery ward on the same stretcher.

Several precautions are taken to protect the mouth, eyes, nose and ears against abrasive dust thrown by the high-speed drill. The mouth is protected by a rubber dam. The eyes and nose are protected by sheet rubber tightly attached to the face with adhesive tape. The external auditory canals are lightly plugged with cotton.

The advantages of rehabilitating children under this type of program are many and rewarding. In the absence of such a service as this, children, especially the handicapped, may be condemned to progressive dental decay and tooth destruction. The real advantage, however, we believe, accrues to the patients who are unable to co-operate. Shall we rather say that the advantages accrue to the parents, to the dentist and to the patient.

The child has his dental treatment completed in a single session which is, as far as he is concerned, completely without unpleasant features. The mother (who suffers most from the frequent frustrating and humiliating trips to the dentist's office) takes the child home from hospital with her personality as intact as the child's. The dentist can accomplish in a two-hour session of comfortably productive work what would otherwise have taken many hours of exhausting, exasper-

ating coaxing, and with not a single bitten finger nor loss of temper nor dignity.

All this is accomplished at the cost of a two-day stay in hospital and a fee for anaesthetic services. Financially, it is to the parents' advantage, as the anaesthetic fee and hospital cost more than compensate for the many unproductive hours spent in the dental chair under conventional methods of care.

The complications that we have encountered in ten years of this type of service have been essentially non-existent. We have had the occasional haematoma develop from intravenous injection; and mild epistaxis from intubation. We have had no serious complications — no laryngeal oedema, no vocal cord polypi. We have encountered no problems of any magnitude that alter our original premise — established many years ago — that general anaesthesia can be given for restorative dentistry to this young age group with advantages to many and with complete safety to the patient.

There is one single proviso — that dentist and anaesthetist are both aware that constant, expert supervision of the anaesthetic period is essential in this effort. This is no sport for the untrained casual anaesthetist.

With modifications in premedication, and slight changes in management, the benefits of this service can be given on an outpatient or office basis to either adults or children.

MAJOR ORAL SURGERY IN THE DENTAL OFFICE

Patients requiring multiple extractions, or any oral surgery of a complicated nature are, as a rule, healthy in all respects except for their dental problems. There are some patients, for example those with cardiac troubles, chest problems, diabetes which is difficult to control, or certain blood dyscrasias, for whom wisdom dictates admission to hospital and a one or two-day stay in hospital after the operation.

Some dentists and many physicians maintain that all patients undergoing dental surgery of any type under general anaesthesia should be admitted to hospital. To do this on an inpatient basis, at least in Vancouver, is flatly impossible due to the shortage of hospital beds. On an outpatient, one-day stay basis, the Vancouver General Hospital, which has the largest outdoor surgical unit in the city, would have to increase its outdoor surgery capacity tenfold in order to provide patients with this type of service. The provincial hospital insurance authorities are not, apparently, interested in increasing available facilities for this type of surgery. The answer, therefore, is to render treatment in appropriately staffed, well-equipped dental offices.

Our partnership has been involved in dental office general anaesthesia for over ten years. At the present time we supply anaesthetic service to one office. Our case load comprises about 20-25 cases per week — four or five cases each afternoon, and recently we started to handle several cases one morning per week. With this background, we feel a few dogmatic statements can be made concerning general anaesthesia in the dentist's office.

Any anaesthetic administered where the surgeon and the anaesthetist must share the surgical field is in our opinion major anaesthesia, regardless of the type of surgery being performed. The patient's airway must be safeguarded, and be fully patent throughout the length of the procedure. To accomplish this the anaesthetist must be well trained, with a broad background in his field, and more than merely adequate in handling inhalation anaesthesia. This is not the place for the partially-trained, inexperienced physician to "augment his income." Exposing these patients to anaesthetic agents and methods of doubtful safety, and to potentially dangerous hazards should not be tolerated nor condoned.

Equipment in the dental office must be more than merely adequate. Gas machines must be well maintained, with sufficient spare equipment. Endotracheal

equipment, laryngoscopes, suction apparatus and drug supplies must be maintained at a high level of efficiency. The mechanics of patient transport must be well organized, and the supervision of the recovery period thorough. Gas supplies should be piped through the surgery from large tanks, with sufficient small tanks to cover any emergency.

Many remarks are made concerning the adequacy or inadequacy of the "physical set-up" in dental offices as if this were the fundamental safety precaution. We reiterate that the proper choice of personnel, is by far the most important safety precaution in the administration of general anaesthesia in the dental office.

Dental extraction is an elective procedure. Therefore, selection of patients for general anaesthesia is an area with definite and pre-determined standards, about which there should be no compromise. The patient who presents a well-defined medical status suggesting admission to hospital is refused office care. The very young, the very old, the very obese, the large patient who may present difficulty in handling while unconscious, are refused. Upper respiratory infections, gastrointestinal upsets are cause for postponing the operation. Any intake of food before the operation is cause for postponement. We do not apologize at all for turning down a patient for anaesthesia in the office — our one aim is not to take unnecessary risks.

While most anaesthetists are more comfortable with their patients on a table, most dentists work better with the patient in the dental chair. We have found that anaesthesia can be quite comfortably administered in the dental chair. We have encountered no precipitous falls in blood pressure and fainting as described by some of our English colleagues, and we have watched these patients closely.

We consider that in oral surgery, the use of an endotracheal airway is a "*sine qua non*." We personally feel that in any situation where trouble with the airway has developed, that the legal principle of *res ipsa loquitur* would apply if an endo-

tracheal tube had not been inserted prior to commencing the operation. In other words, if trouble is encountered, it is up to the anaesthetist to prove that he was not negligent and that he had some good reason for not employing the safest technique available. Patients do not object to the minor irritation of a sore throat nor do they object to the muscle pains occurring after using succinylcholine to facilitate intubation, providing an explanation of the sore throat and the muscle pains has been made before they are anaesthetized. We emphasize to the patient that their usage is in the interest of safety, and we have had no adverse reaction in this regard.

Until the spring of 1962 we employed nasal intubation almost routinely. However, one or two brisk nasal haemorrhages occurred, and our dental surgeon suggested that the slight nuisance of an oral tube would be more desirable than the occasional bad nose bleed. Therefore we switched to oral intubation. The dental surgeon now works with the tube in the mouth almost as comfortably as before, and we have eliminated one more complication.

The office in which we work is not designed to limit static electricity build up. Forceps have been known to cause sparks if they slip off teeth and occasionally our dental surgeon uses his high-speed drill. Therefore, in the interest of safety and to be on safe legal grounds, we employ nothing of an explosive nature. The anaesthetic agents used are intravenously administered barbiturates, succinylcholine, nitrous oxide with halothane, chloroform or trichlorethylene as adjuvants.

Our average operating time is just over half an hour. Because of this we have seen no great need for using the extremely short-acting intravenous induction agents. Sodium thiopental gives us satisfactory inductions and does not prolong awakening. Our dental surgeon works deliberately, does a thorough alveolectomy when indicated, and carries out a careful haemostatic suturing of the gum margins. This takes a little extra time, but we are

quite comfortable and in no hurry. The thorough haemostasis is a big factor in avoiding post-anaesthetic laryngospasm, which we find is no problem whatsoever.

Having stated our general premises as to personnel, equipment and risk, let us proceed to discuss the actual handling of the patient.

Patient Management

The patient reports an hour prior to operating time. The physical status is checked — chest, heart, blood pressure and a general examination. The medical history is gone into fully — inquiring especially about the heart and chest, treatment with adrenal steroids, and any continuing medical treatment and reaction to previous surgical operations and anaesthesia. Each patient signs a consent specifically for the operation and also authorizing the administration of general anaesthesia. This consent, together with a carbon copy of his anaesthetic chart, are kept as part of his record in the dental office. His original chart is kept in our own office as both a medical and a business record. Our dental surgeon is also a physician and he examines our patient for us. Problems are settled in consultation with the anaesthetist. When the examination of the patient has proven satisfactory, mild premedication—meperidine HCl 25 mg, atropine grains 1/150 is given intra-muscularly forty-five to sixty minutes before induction time. The bladder and bowels are emptied before the patient is seated in the chair.

The female patients undress to their undergarments and wear a full gown in the chair. Male patients remove their shirt and wear the gown. Watches, jewellery and dentures are removed and put aside for safe-keeping.

Induction of anaesthesia is usually accomplished with a small dose of an intravenously administered barbiturate (sodium thiopental 250 mg), and a small dose (20-40 mg.) of succinylcholine is injected to ensure relaxation of the jaw. The

trachea is carefully intubated with an oral tube, the cuff inflated, and anaesthesia maintained with halothane in a moderately low flow (2 litres per minute) of oxygen, using a partial rebreathing set-up, with a Roswell Park type carbon dioxide absorption technique. The blood pressure, pulse and respiration are observed closely. A throat pack is inserted to facilitate clean-up of the mouth following the operation.

At the termination of anaesthesia, the chair is levelled and elevated so that the patient can be rolled out of chair onto a stretcher on which the patient is moved to the recovery room. The stretcher serves as a recovery bed until he is sufficiently conscious to look after himself. This is usually less than fifteen minutes. Recovery space is available for four patients, but our first patient has usually left the office before the fourth patient is in the chair.

Complications

The complications of five years of this type of practice have been gratifyingly infrequent. In spite of rigid exclusion of the patient with "a cold," we have had one case of postoperative bronchopneumonia. We are aware of one postoperative thrombophlebitis in a patient who had suffered from thrombophlebitis in his legs and who developed a phlebitis in the arm used for induction of anaesthesia in the office. The nasal haemorrhages mentioned with nasal intubation were of small consequence in all except one case. Hypotension, even in the semi-upright position and using halothane, is rather the exception than the rule, and when it does occur, is the result of over-vigorous application of halothane. Sore throats and muscle pains as explained above, are not a troublesome feature. Laryngospasm is not seen — probably due to the high oxygen content of the inhaled atmosphere, the effect of halothane, and proper post-operative mouth toilet.

Our opinion has frequently been sought concerning the advisability of a dental surgeon administering anaesthesia himself. In highly unusual circumstances, it is justifiable for a surgeon to give or to supervise a general anaesthetic and at the same time perform the operation. The unusual circumstances would be, for example, an emergency operation where no other physician was available to give the anaesthetic. A second possible circumstance would be in a very isolated community, where a surgeon might administer a spinal anaesthetic and have his nurse supervise blood pressure, respiration, etc., while he operated. Over the past fifteen years devoted exclusively to anaesthesia, we have found that supervising the patient's condition under modern potent anaesthetic drugs is a full-time job for any one individual. We would suppose that most dental surgeons find their surgical procedures a full-time responsibility also. We must unequivocally condemn the practice of intentionally and electively acting as both surgeon and anaesthetist where general anaesthesia is being employed.

General anaesthesia, administered by trained and experienced anaesthesiologists in well-equipped dental offices, is a safe and desirable solution for the patient requiring major dental care who wants the comfort of unconsciousness.

To insist that these patients be admitted to hospital is being unrealistically impractical. To refuse them general anaesthesia in the dental office is being unnecessarily cautious.

SUMMARY

General anaesthesia can be safely and successfully administered to the problem or handicapped child in hospital.

General anaesthesia can be safely administered in the well-equipped dental office provided certain standards are set and adhered to. These standards include skilled and competent anaesthesiologists; adequate equipment, well-maintained; proper recovery facilities; careful selection of patients; thorough preoperative medical examination; and the use of non-explosive agents and techniques.

Dental surgeons should not administer general anaesthetics and simultaneously perform a surgical operation. Nor should they condone or tolerate untrained physicians or dentists who might be tempted to provide anaesthetic service.

RÉSUMÉ

On peut administrer avec succès et sans danger l'anesthésie générale dans un hôpital aux enfants physiquement et mentalement malades qui ont besoin de traitements dentaires.

On peut de même administrer l'anesthésie générale dans un cabinet dentaire bien organisé pour certains autres patients à condition d'établir et de suivre des standards convenables. Ces standards exigent des anesthésistes compétents et adroits; un équipement commode et bien entretenu; des disponibilités pour la récupération; un choix minutieux des patients; un examen médical complet avant l'intervention; et l'emploi d'agent non-explosif.

Les chirurgiens dentistes ne devraient pas administrer l'anesthésie générale et opérer en même temps. De même, ils ne devraient pas trouver des excuses pour utiliser les services, comme anesthésistes, de médecins ou de dentistes qui n'ont pas l'entraînement nécessaire et qui seraient tentés de ce faire; cet état de chose ne doit pas être toléré.

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Pain in dentistry: psychological aspects

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Appropriate planning for the care of a person with a dental problem is not limited to a study of immediate oral cavity symptomatology. Careful consideration is usually given to many vitally related aspects. One of these factors is the topic for discussion here. It involves the management of pain. In addition to pharmacological approaches, the subject of pain may be explored from a psychological point of view.

The purpose of this essay, therefore, is to discuss some concepts concerning pain, and furthermore to explore some ideas concerning its management as a function of human relationships.

The literature offers little information which specifically relates management of dental pain to psychological knowledge. It is quite apparent that this is a fruitful field for studies in applied psychology. Nevertheless, the general subject of pain and its anticipation or avoidance has been a favourite topic throughout psychological study. It is also pertinent to note that the word fear frequently appears in close association with the word pain both in dentistry and psychology.

Some discussion about pain as a subject for psychological investigation is appropriate here. An excellent academic discussion of earlier concepts and approaches is offered by Boring.¹ While for immediate purposes this material may be interesting historically, it contains information which has provided a basis for much current thinking in the general subject area. Furthermore it raises questions which have

served as important bases for thinking and research in the last twenty-five years. Before current research trends could be developed a great deal of enquiry into problems in tactual pressure, sensory thresholds, thermal stimuli, adaptation capacities and many kinds of perceptual behaviours had to be undertaken. Early investigators gave lots of attention to localization and specificity of function. It was hypothesized that there might be special receptors for the various sensory modalities.

Much of the exploration was based on this premise. Some attention was being given to the concept of generalization of function, particularly with regard to the central nervous system. Many of us still tend to pursue problems in terms of specificity. For instance, if we are not careful we can even treat our topic in this discussion as if it were an entity and not an integral part of the functioning of a person. At any rate, it is certainly urged that any serious pursuit of this subject include Boring's survey. Although not of recent origin, the reader may also find some value in reviewing the findings of Pavlov. Among other things he studied and demonstrated a basic response relationship between pain responses and other sensory-behavioural responses. Here was demonstrated an important finding concerned with the integrating nature of neural action.

The response-relationship was one in which the effect of a pain-producing stimulus was conditioned to extinction. In other words, when the pain-producing stimulus was successfully integrated in a hierarchy of sensory functioning its pain aspects disappeared.

Hebb² offers a more recent discussion

Presented at the Annual Meeting of the Canadian Dental Association, Vancouver, June 5, 1962.

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of our subject. He gives attention to the motivating aspects of pain and evaluates the subject in terms of its vital relationship to the learning of the organism. Definitive and thought-provoking discussions of the sensory nature of pain are provided by this author. It is hoped that the reader in exploring this reference will give particular attention to Hebb's concept of the relationship between pain and cortical organization. One is particularly struck with the close similarity between these discussions of central nervous system organization and integration and our various clinical observations having to do with maturity and regression. Perhaps a valuable pursuit in dentistry would be that of studying the matter of cortical organization and those factors which promote it. In a way of speaking, this is the nature of our topic in this discussion. The synaesthetic nature of sensory experience is discussed by Church³ in his recent publication. It provides an excellent theoretical basis for some of the points to be made in this essay. He describes some recent investigation into the perception of pain.

The inference again is that of placing importance on neural integration. His explanation of cross-sensory functioning is particularly interesting. He refers to the communal nature of sensory modalities. Certainly, deeper understanding of this concept will be of value in helping people who are in pain or who are prompted to avoid it. This publication, incidentally, contains a wealth of general information in terms of its potential application to many dental problems. To return for a moment to Hebb and his discussion of intensity limen problems: He indicates that for most sensory modalities there is a point or threshold of intensity at which the organism is prompted toward avoidance behaviour or, on the other hand, must accept the risk of pain. Stimuli which might be of such magnitude as to be disruptive in character may cause the individual to seek avoidance and, furthermore, may cause him to use fear as the mechanism of defence. From a psychological

point of view, one now questions whether the problem is that of dealing with pain itself or with the behaviours which its anticipation may stimulate.

Miller⁴ recently has posited fear as a drive which should be regarded as one of a group of basic drives. He places great importance on the motivating aspects of fear and on its value in organizing and determining the adaptive measures undertaken by the organism. Perhaps of greatest value for us is his contention that fear reduction or escape from fear is of tremendous value in reinforcing learned behaviour. By way of practical application, for instance, one might point out that perhaps a dental patient could be taught to accept and complete adequate treatment as part of his own anxiety or fear-reduction effort. Actually many of us have learned so successfully to allow a fear response to motivate or prompt avoidance behaviour within us that the dentist is faced with a real learning (re-learning) problem when dealing with a patient on this basis.

It is also correct to add that the dentist is dealing with his own learning history with regard to pain and fear as well as with that of his patient. It is not the intent of this essay to offer an exhaustive study of the field. These references have been identified only as representative works. Multitudes of studies are available which encompass all aspects of human behaviour. This writer feels that many of these studies have excellent implicit application in understanding fear and pain problems in a dental patient. A serious investigation of these data can be initiated by referring to the recent four-volume work edited by Koch.⁵

Certain concepts about pain may now be discussed. For one thing, in the psychological management of pain (and perhaps we are really talking about fear), it is quite clear that the use of repressive or inhibitory measures does not represent the approach of choice. Our task may be more accurately defined as that of helping the patient handle his avoidance efforts in the

face of feared pain. Or, maybe our task is that of helping the patient keep his responses to various stimuli (fear-producing ones) organized in a hierarchy of other kinds of central nervous system responses. We may find that a suitable long-range technique is that of helping the patient learn that fear reduction may be accomplished best by eliminating the fear-producing stimulus in a particular way, i.e., by completing treatment. Or, as Miller infers, it may be just as important to help the patient reduce the strength of his avoidance behaviour as it is for us to try somehow to increase the strength of his motivation. Any prompting involving the latter technique may very well increase the patient's fear and thus increase his avoidance activities. Yet many of us have invested lots of energy in attempting to induce stronger motivation in our patients. This, then, is a management concept which may warrant your most careful attention.

As an approach to the more practical aspects of this essay, it now seems appropriate to discuss several tangent but pertinent clinical concepts about human behaviour. These bear on the general matter of human relationships and they are importantly related to the management aspects of our problem. Furthermore, the concepts to be discussed here represent a rather eclectic dynamic approach to the matter of human behaviour. This approach typifies much of the thinking in psychology today, and the author offers no claim of origination in this regard.

Now to discuss these concepts which seem germane to our subject. We view the human being today as a dynamic and wholistic organism. In terms of those individual potentialities or parameters which may characterize a person, his functioning is carried out as a total unit. Any attempt to treat a discrete part and disregard the totality of the person does in itself force the patient into adjustment efforts which might not be employed if the concept of wholism were to be observed. In other words, in any treatment situation (or in any human relationship

situation, for that matter), the total human condition needs to be seen and talked about.

A second concept is often troublesome both in terms of evaluation and acceptance. This essayist takes the position, however, that every human activity, voluntary or not, explicitly stimulus-related or not, is based on a reason or need. Much of our difficulty in dealing with this concept lies in the fact that a great deal of our activity originates from needs that are maintained below the level of consciousness. As at matter of fact, it is quite probable that more of our behaviour is predicated on motives below consciousness than on needs that are purely conscious. Furthermore, the individual is never characterized by a single need, and as a consequence these needs are maintained in a kind of hierarchy or prepotency, as one might say. This priority system is dynamic in character, and changes in the hierarchy take place primarily as a function of need-satisfaction. Satisfaction may be variously described, but for our purpose let us use the word "reward" as synonymous. This reward problem is several-fold. Psychology today contends that behaviour in a given situation is based on the organism's effort to search out that line of action which contains the greatest possibility for reward or, in other words, need-satisfaction. Reward in this sense does not need to be limited to a concrete form. It may take the form of fear reduction, relief from anxiety, goal-completion or achievement in some other fashion. The need to escape from fear, for instance, may be high on the priority scale. Our task may be that of integrating this need so that it takes a somewhat subordinate role in the response hierarchy. As we will see, this may be greatly dependent on the maturity of the dentist. His higher mental processes may actually provide the integrating force that will allow the patient to maintain his fear responses within manageable limits. This is one meaningful aspect of the dentist-patient relationship.

The next concept concerns the general

matter of perception. This has been a problem long debated in the field of psychology. For purposes of our discussion here this essayist takes the position that probably perception is stimulus-bound at the nominal or logical level. Even at this point, however, it is quite possible that the individual's perception is determined to some extent by his needs at that time. As one's anxiety level or fear responses appear, however, it is more probable that the individual's perception is increasingly determined by whatever his priority of needs may be at that moment. One more point with regard to perception needs to be made. Behaviour in a given situation is never wholly a function of the moment but vitally related to learning from the past. In other words, a great deal of our difficulty in dealing with pain and fear is not that of immediate reality stimuli. Our problems are very strongly related to the individual's previous learning about these matters and thus management may be a greatly individualized matter. This again calls attention to the importance of viewing each patient on a wholistic basis. An excellent discussion of this whole matter of perception and the dynamic character of needs is presented by Maslow⁶ and I recommend his publication very strongly.

It is hoped that the reader will take cognizance of the important relationship between management of a dental patient and the whole concept of learning. In truth, one may regard a treatment experience not as treatment but as a learning experience from the standpoint of the patient. Actually, the ability to learn is indispensable to life. It is basically the vehicle by which the individual comes to satisfy his needs. When we speak of learning in this sense, one of the problems which presents itself is the fact that we frequently fail to look at the dental environment as the patient sees it. We fail to take cognizance of what the patient is learning about the dentist, about dentistry and about himself in that setting. And yet, if we are to deal effectively

with the patient's various responses to treatment we will be powerless to know what to do until we see the treatment situation through the feelings or perceptions of the patient. Only then will we know what he needs to learn.

A psychologist, of course, would take the position that a dental treatment situation is actually another study in human relationships and one which takes place with certain stress characteristics being present. From the standpoint of practical management techniques, then, this essay is talking about the matter of human relationships. One way to describe any human relationship is to say that it involves the meeting, testing and selective integration of the needs or motives of both parties in the relationship. This is the core of the many processes implied by the word learning. In any such human relationship we probably do not learn about things or processes or objects until we have learned something about each other as human beings. It is becoming increasingly clear in the study of human relationships or human communication that we are insistently imposing upon or telling the world around us all about ourselves. This must be true, otherwise the concept of wholism is invalid and we must start off again in this long search for understanding of ourselves and each other. This infers again that the nucleus of this problem we are discussing somehow is to be found in the dentist-patient relationship and not in a so-called management technique.

The core of this relationship or learning experience is embodied in the word "identification" and it is desirable to discuss it for a moment at this point. Let us regard identification as the process by which one person can take into himself and duplicate in his own feelings or perceptions something of the nature of the other person, or some other environmental object. This is the act which occurs when we learn how to read, ride bicycles, daydream or when we learn what to do in the face of fear. The process of identification takes place more auto-

matically and with greater intensity when one person is in a position of strength or authority and the other person is in a position of dependency or vulnerability. It takes place on the basis of frustration where relief from frustration or fear is accomplished by adopting something presented by the other person. For example, it is the dynamic process by which an infant and his mother communicate. It is the way one person learns trust and security in his relationship with another. In a treatment situation such as we are talking about here, it takes place with greatest value when the person who is called the dentist is able to demonstrate to the person who is called the patient a very simple fact; namely, that one of the dentist's highest needs (in terms of the priority system previously discussed) has to do with being concerned about the needs of the patient. All management techniques, if we are to call them such, are dependent therefore on this concept.

Now to make some additional comments about the matter of the treatment situation. Perhaps the first dimension in this respect has to do with the dentist himself and more particularly with that dentist's own learning and attitudes toward pain and fear. If within himself he is rather persistently prompted toward anxiety responses around these subjects, then he must accept the possibility that he is communicating this fact to his patient. This in itself will intensify the patient's avoidance behaviour or fear reactions. Next, many of us, in our own learning history, have come to deal with anxiety and fear through various means such as denial, avoidance, anaesthetization or repression. One of the most valuable management techniques we can learn is that of not being afraid of another person's anxiety responses. If we were to accept them as expressed needs of the patient, one will soon find that the patient's responses will tend to integrate themselves within a framework of an identification with the dentist. This represents the kind of organizing activity which is so important in neural integration and

is one of the primary values of the act called identification. Here one finds the fundamental act by which the patient can maintain useful control over his own avoidance responses. Of course some people are sufficiently self-possessed so as to have little need for a dependency relationship, but these are not really the patients we are discussing. The usual consequence of successful identification is a sense of security. When this has been achieved sufficient neural integration is usually present so that the person can keep his feelings of fear subordinate to his feelings of trust with the dentist.

Keep in mind that the oral cavity is the site of some of the first and certainly the deepest learning in the organism. Activities centered thereupon may very well call up some of the earliest and strongest responses within the individual. While pharmacological approaches are of great value here, if we are talking about dealing with pain and fear from a purely psychological point of view then great stress must be placed on the nature and motives of the person who has primary treatment responsibility. The inference here is simply that your own motives or needs are certainly going to be communicated to the patient. It is a challenging idea, is it not, when one considers the probability that a great deal of success here is dependent on what these needs of yours turn out to be? This is a matter of self-examination and understanding.

In general, you should be warned against using logical reasoning processes with a patient if his anxiety or fear responses are already obviously elevated. Such an effort on the part of the dentist will usually create an intensification of the patient's anxiety level. Again we turn here to the importance of seeing the situation in terms of the patient's needs and then predicating our communication with him on our understanding of those needs. You may very well respond to this by saying, "What do we do then if his strongest need is that of avoiding treatment altogether?" Here is an important learning problem. It is one in which the dentist

must maintain enough objectivity to state treatment needs, to be very respectful of the patient's anxiety needs and to impart above all the simple fact that the dentist's primary concern has to do with the treatment needs of the patient. You may very well lose your patient if you identify too strongly with his avoidance behaviour (without knowing it) and you may also lose your patient if only the dental treatment need is taken into consideration when you communicate with him. This is important to reiterate. Maintain communication with him about his general needs and within this framework you can deal with the specificity of his dental needs.

If you have a patient with rather strong fear responses it would seem appropriate to welcome some regression, within limits, on the part of the patient since this will increase the probability that he will need to identify with you as the primary way of handling his anxiety.

Now let us come to grips with another aspect of this treatment situation or learning experience. The learning theorists suggest that maybe our real task here is not entirely that of bringing fear to the point of extinction but more rationally that of allowing it to operate within limits so that the successful completion of the treatment experience and fear reduction will occur at the same time and in the same environment and more importantly with the same person — in this instance the dentist. If the patient has an adequate identification with the dentist, his fear will be kept within operable limits. If it is attached to the success or completion aspects of treatment, then perhaps we have increased the probability that the patient will follow this pathway again when the same kind of fear response is aroused.

It is also possible that many kinds of fear responses carried on within adequate identification will be of value to the patient. In other words, such a response may prompt the child to hold still or not cry and may motivate him to conform or co-operate. This kind of endurance may

be described as a rather normal way to use fear.

Use every means available to put your patient's attention, first, on what you want him to know about the dentist and other personnel and, secondly, on what you want the patient to know about treatment goals. If you can do it, keep his attention away from things of the moment and more on where you and the patient are going in this experience.

If you want to deal with something of the moment and the patient is truly anxious, then identify the patient's predominant feeling and establish a specific short-range goal involving the time at which it will be relieved. The process of verbally rehearsing these feelings is of some value as far as relief is concerned, particularly as long as a goal is stated.

One would like to discuss problems involved in disapproval or the use of threat or the use of anger. Time permits only a comment here. These are repressive or inhibitory measures and for the most part will either intensify the patient's fear or will force a displacement of it, and one questions whether we should be responsible for this act.

We have one valuable ally not often used. It is that of encouraging the dentist to identify and label the patient's attitudes toward treatment and even the patient's attitudes toward the dentist himself. Our purpose here is to help the patient discriminate between those fears which are appropriate to the dental environment and those which have been prompted out of his previous learning about fear. This technique also reinforces the process of identification in that it involves a kind of acceptance which most of us do not often secure in human relationships. Moreover, a learning experience of this sort in which some discrimination occurs is another excellent way of achieving fear-integration. A large portion of our general behaviour has been learned and as such is subject to being re-learned or adequately integrated.

Remember that any act on the part of a patient is a kind of communication, and

as such it must be answered. We too often think of communication as being a verbal act. Let us take the position that any act whether it be silence, anger, smiling or crying is a kind of communication. When this has been recognized and accepted then other kinds of communication are somewhat more feasible. Just the fact that you respectfully accept the act is good communication. Or, the fact that you restrict the act in a firm, considerate way is good communication. Furthermore, it is extremely important that no contradictory behaviour on the part of the patient find reward or satisfaction.

Although written for another field, the reader is now referred to the works of Kofling and Leininger,⁷ and Brown.⁸ These were written for the care of medical-surgical patients, but much of the material is directly applicable to our problem here.

An attempt has been made to set forth some pertinent ideas about people with pain and fear problems. A few concepts and techniques have been discussed. One factor, however, seems to predominate. We need to ask ourselves persistently how the motives and needs of the patient and the dentist are fused and satisfied. Inherent in the mutual identification which characterizes such a relationship one finds the basis for helping people who are in pain or who are fearful in anticipation of it.

RÉSUMÉ

Les traitements dentaires créent chez tout individu un climat psychologique particulier qui se caractérise par une certaine tension nerveuse. Tout rapport entre humains comprend une prise de contact, une évaluation et une intégration graduée des besoins ou des motifs des partis intéressés.

Le noeud des échanges entre le dentiste et son patient se traduit par l'expression "identification." Cette identification cons-

titue le processus par lequel une personne peut intégrer en elle-même et superposer à ses propres sentiments ou à sa perception individuelle un aspect de l'essence d'une autre personne ou d'un objet qui l'environne. Ce processus d'identification s'opère plus spontanément et avec une intensité plus grande quand un individu exerce un ascendant ou une autorité sur une personne qui est en état de dépendance ou d'insécurité.

Cette identification s'établit sur une base de frustration où la personne frustrée se débarrasse de son complexe ou de sa crainte en s'appropriant des concepts énoncés par l'autre personne. Comme exemple, on peut citer le processus dynamique par lequel l'enfant et la mère communiquent. De cette façon, un individu, grâce à des contacts avec un autre, développe un climat personnel de confiance et de sécurité. Au cours des traitements dentaires, cette identification prend toute sa valeur quand le dentiste réussit à faire comprendre cette idée simple à son patient: ce que le dentiste veut d'abord, c'est de réaliser les besoins de son patient. Toutes les techniques d'approche doivent s'établir sur ce concept.

Le dentiste doit savoir que, s'il développe en lui-même une certaine anxiété en face de la douleur et de la crainte, il communique inévitablement cette réaction à son patient: il accentue chez celui-ci la crainte et le goût d'évasion. Le dentiste doit savoir qu'une des meilleures techniques d'approche consiste à ne pas s'emouvoir des réactions d'anxiété de son patient; il se rend bientôt compte, s'il considère les réactions de son patient comme étant l'expression d'un sentiment naturel, que ces manifestations sont, par un phénomène d'intégration, l'acheminement normal vers son identification avec le dentiste. C'est une manifestation essentielle du contrôle que le patient peut exercer sur son désir d'évasion. Une identification parfaite se traduit généralement par un sens de sécurité. Le patient, après cette phase d'adaptation, peut subordonner ses sensations de peur à ses sentiments de confiance envers le dentiste.

Le dentiste, face à un patient dont l'anxiété et la peur sont extrêmes, ne doit pas tenter de le raisonner; le dentiste ne réussirait qu'à intensifier ce sentiment d'insécurité. Il faut mâter la situation en se mettant au niveau des sensations du patient et établir la communication avec lui sur la compréhension de son émotivité. Le dentiste doit comprendre une fois pour toute qu'il doit d'abord se préoccuper des besoins de son patient pour des traitements, tout en respectant son anxiété. Le dentiste n'obtiendra aucun succès s'il identifie trop intimement avec la tendance de fuir qu'éprouve son patient; de même, il se voue à un échec s'il n'envisage que les traitements à prodiguer. Il faut entretenir une communication avec le patient dans son ensemble. C'est dans cet esprit que le dentiste peut aborder les besoins dentaires de son patient.

Il est normal d'anticiper et même d'accueillir une certaine répulsion, mais dans des limites raisonnables, chez un patient pusillanime; cette manifestation favorise considérablement son identification avec le dentiste et c'est là la première phase du contrôle de cette anxiété. Il ne s'agit pas de tenter d'annihiler cette crainte, mais de la canaliser: ainsi, la peur ira en s'amointrissant au cours des traitements, dans le même environnement et au contact de la même personne c'est-à-dire le dentiste. La nervosité du patient, si celui-ci s'identifie adéquatement au dentiste, se situe à un niveau où des traitements deviennent possibles. L'expérience se déroule dans les mêmes circonstances

quand le patient se retrouve dans un état identique, si les traitements sont terminés avec succès.

Le patient bénéficie de cette identification suscitée par des réactions de crainte. Cette expérience porte un enfant, par exemple, à se tenir tranquille, à ne pas pleurer et le motive à collaborer et à se conformer aux diverses circonstances de la vie. C'est se servir normalement de la crainte pour se bâtir une résistance.

Il faut condamner les menaces, la colère, les blâmes: ce sont des mesures qui favorisent l'inhibition. Elles peuvent de plus augmenter l'angoisse du patient ou en changer la nature. On peut se demander jusqu'à quel point va la responsabilité du dentiste dans ce domaine.

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Special Issue on Periodontics • The May 1963 issue of the Journal will be devoted to a review of periodontics. Among the articles to appear in this issue are: Integration of periodontics into a general practice, Diagnosis and treatment planning for the periodontal patient, Occlusal correction. Surgical management of periodontal pockets. Common periodontal problems, and Current trends in the teaching of periodontics. The first five articles are in English and are accompanied by extensive French résumés. The final article, which is in French, has an English summary.

HEALING OF ALVEOLAR BONY AND DENTINAL DEFECTS AFTER IMPLANTATION OF POLYVINYL ALCOHOL SPONGE*

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The use of polyvinyl alcohol sponge (PAS) as a grafting material has had extensive experimental investigation and widespread application in a variety of surgical fields; however, considerable differences of opinions exist as to its value.

Objections have been raised to its use in soft tissue surgery because it tends to calcify and harden, but this tendency may be of advantage in hard tissue surgery. Investigators agree that connective tissue and bone grow into the porous sponge but they differ in their opinions regarding its value as a bony implant.

This study was undertaken to explore tissue responses to PAS in various bony and dentinal defects, and to assess its healing value therein. Small defects of three types were produced surgically in the alveolar bone of the jaws of seventeen dogs. These defects were filled with PAS or left unfilled as contralateral controls.

Aseptic healing of these defects was studied microscopically, radiographically and clinically. The ages of the control and implant defects varied from 3 weeks to nearly 1½ years.

Of thirty-five grafting procedures 21 were considered successful when the grafts were retained firmly, and connective tissue or connective tissue and new bone penetrated the sponge. Interlocking occurred in the older implants. Although PAS delays early bone formation, in certain types of defect it appears to increase later bone formation. Profuse formation of fibrous tissue occurred in and about implants, and there was little evidence of deterioration in either implants or host tissues.

Among observations of special interest were (1) muscle fibres penetrating implants, and (2) implants, containing proliferating fibrous tissue and new bone, in contact with periodontal ligament reattaching to newly formed cementum lining defects in dentine.

These observations suggest interesting lines of further investigation and clinical application, some of which are already in progress.

EFFECT OF DIET ON HAMSTER SALIVARY PHOSPHATE

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Three groups of adult hamsters were maintained for a month on the following diets: (a) control: normal laboratory diet (1.3 per cent P); (b) cariogenic diet (0.4 per cent P); and (c) caries resistant diet (Diet B + 0.8 per cent P or a total of 1.2 per cent P).

Summaries of reports delivered at the Second Canadian Conference on Dental Research held at Banff, Alberta, October 9-11, 1962.

*This investigation was supported by the National Research Council of Canada.

Prior to saliva collection, animals were deprived of food for periods of time which varied from one to eighteen hours. The hamsters were anaesthetized lightly before saliva collection. Swabs of absorbent cotton were used to obtain saliva. Other swabs were dipped into standard solutions of Na_2HPO_4 as controls, and dry swabs were used as blanks. The cotton pads were wet ashed.

Phosphorus was estimated colorimetrically.

The levels of salivary phosphate were markedly affected by the nature of the diet, the dietary phosphate level, and the period of food deprivation.

FLUORIDE-CARBONATE RELATION IN HUMAN DENTAL ENAMEL

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There is substantial evidence that during mineralization, fluoride ions substitute for hydroxyl groups in the apatite crystal structure, forming fluorapatites which effect a reduction in the solubility of the mineralized tissue. However, the fluoride concentration of dental enamel obtained from persons living in areas containing significant amounts of fluoride in the water supply indicates that only one out of approximately 300 hydroxyl groups is replaced by fluoride. It is improbable that the observed reduction of enamel solu-

bility by fluoride is related to such a limited substitution of hydroxyl groups; hence, the hypothesis that the mechanism by which fluorides reduce caries may involve a reduction in the concentration of solubilizing anions in teeth such as carbonates and citrates.

Purified enamel powder from deciduous non-carious and carious teeth from fluoride and non-fluoride areas was analyzed for fluorides and carbonates. The mean value and standard error for enamel samples from a fluoride area were 2.51 ± 0.04 per cent CO_2 and 133.7 ± 19.6 ppm of F^- , and from a non-fluoride control city 2.71 ± 0.04 per cent CO_2 and 48.4 ± 8.7 ppm of F^- . The difference in the mean values for carbonate and fluoride was statistically significant ($P < 0.01$). Analysis of the outer layer of enamel from carious and non-carious teeth obtained from a fluoride area (1.0 ppm F^- in water) indicates a significant difference in the carbonate (1.900 ± 0.077 per cent CO_2 for non-carious and 2.135 ± 0.045 per cent CO_2 for carious teeth) and fluoride (357 ± 93 ppm F^- for non-carious and 229 ± 50 ppm F^- for carious teeth) values. No significant differences in carbonate values were detected in enamel from carious (2.03 per cent CO_2) and non-carious (2.07 per cent CO_2) teeth obtained from an area containing low levels of fluoride in water (0.1 ppm). These findings tentatively support the hypothesis that a significant relationship exists between the average concentration of fluorides and carbonates in enamel, and the observed relation is not a simple substitution.

C.D.A. Art and Flower Exhibit • Dentists, members of their immediate families and their employees are invited to submit flower displays, oil paintings, sketches, pastels, sculpture, ceramics, pottery, shell craft, leathercraft, woodwork, miniature castings, photographic enlargements, transparencies or any other handiwork in the arts and crafts for display at the Art and Flower Exhibit of the forthcoming annual convention of the Canadian Dental Association at Toronto, May 19-22, 1963. Additional information may be obtained from Dr. J. G. Dale, Canadian Dental Association headquarters, 234 St. George Street, Toronto 5, Ontario.

Support the Canadian Fund for Dental Education

Establishment of the Canadian Fund for Dental Education is a welcome development for the progress of dental education in this country. Launched earlier this year with donations from the dental dealers and manufacturers and from the Canadian Dental Association amounting to nearly \$15,000, the fund is intended to advance dental education and assist dental schools by providing support for teaching and research projects, elevating the qualifications of dental teachers, promoting scholarships and student loans, and by helping to recruit new students for our dental schools.

The initiative for this venture came from outside the profession. We owe a very real debt of gratitude to the dental supply industry, for without the enthusiasm displayed by the industry's leaders the fund would probably not have come into existence.

The next task will be to build up the capital assets of the fund to a level where

applications for grants and other assistance can be entertained. In order to do this, the fund will require support from the profession at large before it is able to attract further money from sources outside dentistry.

One immediate objective will be a nation-wide campaign for contributions from the dental profession. This will provide every dentist with an opportunity to demonstrate in a tangible manner his faith in the future of our profession.

Another form of support is the "living memorial donation" whereby tribute to deceased members of the profession is expressed in the form of donations to the fund rather than in the form of flowers. In recent years living memorial donations have gained wide-spread acceptance as a source of contributions to other philanthropic undertakings. They merit earnest consideration with respect to the Canadian Fund for Dental Education.

Board of Governors • The Board of Governors of the Canadian Dental Association is composed of members selected by dental organizations in all ten provinces. The Board meets annually just before the national convention of the Association. Any member of the Canadian Dental Association may participate in the Board's annual meeting. Canadian dentists are urged to avail themselves of this opportunity to participate in the affairs of their profession.

Dental service corporations and fee schedules

If any one of Canada's ten provinces were to institute a government-subsidized prepaid dental care scheme to-morrow, the dental profession would be hard put to it or even incapable of operating such a plan. Unlike the medical profession, we do not at present possess the mechanism to administer programs of prepaid dental care on a wide scale. The public might therefore be pardoned for concluding that the dental profession is either unprepared or unable to offer any realistic help in this matter.

Yet this is precisely the possibility which we face right now. Having launched a government-operated medical care scheme, Saskatchewan is now taking a close look at the dental needs of her people. In neighbouring Alberta the government proposes to co-operate with the medical profession in a voluntary, government-subsidized scheme and is also known to be deeply concerned about dental care. Whoever wins the next provincial election in Ontario will introduce legislation for a health care plan in that province. And from all accounts action of one sort or another in this field is contemplated in British Columbia.

Clearly, these developments, and others not yet evident, will shape the future course and pattern of health services for many years to come. It is timely, therefore, for a realistic appraisal of the position of the profession. Dentists might well ask whether provincial dental care schemes will be introduced next. If so, how soon will they follow? Will they be voluntary or compulsory? And who is to administer these plans? Comments from informed sources suggest that there may be no undue delay in the implementation of dental plans. In fact, one provincial cabinet minister has already asked the dentists of his province what they can do to facilitate such measures.

The implications are rather obvious. Here is an opportunity for the profession to demonstrate publicly its ability and willingness to organize and implement efficient and purposeful dental care plans in co-operation with the people and their elected representatives. The alternative is a retreat behind a dismal facade of emotional but meaningless slogans about "socialized dentistry," coupled with the virtual abandonment of our social obligation in guiding the dental destiny of this nation. But if we choose to respond positively, we must prepare now to meet whatever responsibilities the future may hold for us.

A first requirement is the establishment of a proper mechanism to administer dental care plans. This calls for the creation of a dental service corporation in every province. Such a corporation could contract with governments and other subscribers for the provision of prepaid dental care. The corporation would establish policies and administer the dental care plans on a non-profit basis. In smaller provinces the corporation might elect to purchase accounting services from Canadian Dental Service Plans Incorporated, rather than go to the expense of establishing its own separate accounting facilities. The corporation should have lay representation in order to function effectively. Dentists, because they control the corporation, would protect the quality of the dental care plans offered. Consumer groups, because they deal with a single vendor, would be relieved of the day-to-day administration of their plans and of the necessity of supervising quality of care controls.

Because certain corporate members of the Canadian Dental Association now administer limited dental welfare programs, it has been suggested that they merely extend their activities to embrace all

future purchasers of prepaid dental care and dispense with a dental service corporation. Another alternative proposal concerns the establishment of a single national dental service corporation to avoid the necessity of creating ten similar provincial agencies. Unfortunately neither of these suggestions is practical. The officers of the corporate members are elected by dentists and deal primarily with matters of concern to the profession. Any intermingling of these functions with the administration of extensive service plans for the public would sooner or later result in a conflict of interest. Also the public would justifiably question the propriety of having an agency of the profession administer public funds and establish policies without any lay representation. Nor is a solution to be found in creating a national dental service corporation since health is a matter under provincial jurisdiction. Contracts between government and the profession have been made on a provincial level in the past and they will be made at that level in the future. Although the movement of subscribers from one province to another makes interprovincial co-ordination desirable, the creation of provincial dental service corporations remains a necessary first step.

These corporations should be established without delay so that they may be ready to operate the moment the profession is approached with requests or proposals for dental care plans. To wait

until this approach is made and then attempt to establish some sort of mechanism hurriedly could well be disastrous.

Another urgent matter is the adoption by the profession of a single fee schedule in each province. This can be of crucial importance when negotiating contracts with governments or other prospective subscribers. There are really only two choices open to the profession when negotiating such contracts. One of these is an adopted fee schedule which can be used as a basis of negotiation. In this way every dentist has some voice in determining the value placed upon his services. The alternative, in the absence of a fee schedule, is for persons other than dentists to evaluate each item of service. Clearly, the first method is preferable, even in those contracts which provide for reimbursement of less than 100 per cent of specified fees, because the dentist retains an important element of control over the manner of his remuneration.

Since a comparison between fees listed in a schedule and fees charged in actual practice can be readily made, an adopted fee schedule must obviously reflect a realistic tariff in each province. "Suggested" fees or fee "guides" which do not conform to current practice would be rejected by other parties and would be quite useless in such negotiations.

It is not too late for the corporate members to take appropriate action in each province. But time is not unlimited. Let there be no delay.

C.D.A. Attitude on Dental Insurance • While opposing a comprehensive treatment program "at this time," the Association lists the following conditions which should apply in the event of inauguration of such a plan: (1) intensive dental health education of the public should precede and accompany a treatment program; (2) the age groups to be included should be determined by initial and annual assessments of the people's needs and of the dental personnel and funds available; (3) treatment should be provided by dentists in private practice, on a fee-for-service basis according to an acceptable fee schedule; (4) dentists should be free to participate or not; (5) the rights of patients and dentists to select each other should be protected; and (6) administration should be effected by profession-sponsored dental service corporations. — C.D.A. Brief to the Royal Commission on Health Services.

Dental students' register, 1962-1963 Régistre des étudiants pour l'année 1962-1963

Bureau of Economic Research

Enrolment.—There are 1,134 students enrolled in the six Canadian dental schools. This is an increase of 82 or eight per cent over the number enrolled in the 1961-62 term. Forty-seven of the students (four per cent) are women.

The total number of graduates enrolled for further study is 41. Thirty-one of them are in specialty programs in orthodontics (17), dental public health (7), periodontics (4) and oral surgery (3).

Dental Hygienists.—The number of dental hygienists being trained has increased greatly in the past two years. This year 146 women are enrolled in Canada's three dental hygiene programs and the first year of the two-year course is filled to capacity. On a national average, there is one dental hygienist in training for every seven dental students.

Wastage.—The percentage of students dropping out between the first and second year of the dental course was 12.5 per cent, which is comparable to previous years. Twenty-seven of the 40 students in this category failed their first year.

Graduates.—In 1962, 225 students graduated in dentistry, an increase of 29 per cent over the previous year. Of the ten women graduating, nine were foreign-born.

Inscription.—Il y a 1,134 étudiants inscrits dans les six facultés dentaires du Canada. Ce chiffre représente une augmentation de 82 étudiants ou une proportion de 8 pour cent de plus qu'en l'année 1961-62. Quarante-sept (4 pour cent) de ces étudiants sont des femmes.

Le nombre des diplômés inscrits à des cours supplémentaires se chiffre à 41. Trente et un de ceux-ci se préparent à des spécialités: 17, en orthodontie; 7, en hygiène dentaire publique; 4, en périodontie; et 3, en chirurgie.

Hygiénistes dentaires.—Le nombre des étudiantes inscrites à des cours pour hygiénistes dentaires a considérablement augmenté depuis deux ans. Cette année, 146 jeunes filles fréquentent les cours qui sont offerts par trois facultés dentaires et, dans la première année de ce cours de deux ans, toutes les places sont prises. La moyenne générale pour le Canada indique qu'il y a, dans les universités, une étudiante en hygiène dentaire pour sept étudiants en chirurgie dentaire.

Perte d'étudiants.—Le pourcentage des étudiants qui abandonnent leurs études entre la première et la seconde année se chiffre à 12.5 pour cent, un niveau à peu près constant. Vingt-sept de ces 40 étudiants qui sont dans ce cas ont échoué leur première année.

TABLE 1 Undergraduates enrolled in Canadian dental schools, 1962-1963 • Etudiants sous-gradués dans les facultés dentaires du Canada, 1962-1963.

Dental school Faculté	Total	Year - Année			
		1	2	3	4
Dalhousie	68	26	18	10	14
McGill	139	39	33	36	31
Montreal	178	61	52	28	37
Toronto	471	122	120	105	124
Manitoba	104	31	31	19	23
Alberta	174	53	47	42	32
Total	1,134	332	301	240	261

TABLE 2 Women dental students enrolled in Canadian dental schools, 1962-1963 • Etudiantes dans les facultés dentaires du Canada, 1962-1963.

Dental school Faculté	Total		Year - Année			
	Number Nombre	Per cent Pourcentage	1	2	3	4
Dalhousie	2	2.94		2		
McGill	1	.72	1			
Montreal	8	4.49	5	2	1	
Toronto	32	6.79	7	10	9	6
Manitoba	2	1.92			1	1
Alberta	2	1.15	2			
Total	47	4.14	15	14	11	7

TABLE 3 Dental graduates registered at Canadian universities for further study, 1962 - 1963 • Diplômés inscrits dans les facultés dentaires du Canada pour des études post-universitaires, 1962 - 1963.

Dental school Faculté	Graduate* Gradués*	Postgraduate† Post-scolaires†	Special‡ Spéciaux‡
Dalhousie	0	0	0
McGill	0	0	1
Montreal	5	5	0
Toronto	5	25	0
Manitoba	0	1	0
Alberta	0	0	0
Total	10	31	1

*Graduate students are those dental graduates registered in the graduate school of a university and proceeding to a Master's or Ph.D. degree.
L'expression 'gradués' veut dire que ces diplômés sont inscrits à l'Université, dans l'Ecole pour diplômés, pour suivre un cours qui mène à une maîtrise ou à un Ph.D.

†Postgraduate students are dental graduates registered in the dental faculty proceeding to a degree (e.g. the B.Sc.D.), diploma or certificate.
L'expression 'post-scolaires' veut dire que ces diplômés sont inscrits à la faculté dentaire pour y suivre un cours qui mène à un degré (p.e., B.Sc.D.), un diplôme ou un certificat.

‡Special students are dental graduates who are taking postgraduate instruction in the dental faculty but are not proceeding to a recognized university degree, diploma, or certificate.
L'expression 'spéciaux' veut dire que ces diplômés sont inscrits à la faculté dentaire pour y suivre un cours post-scolaire qui ne mène pas à un degré, diplôme ou certificat officiel de l'Université.

TABLE 4 Dental graduates registered in each year of specialty programs at Canadian universities, 1962-1963 • Diplômés inscrits dans chaque année de cours de spécialités dans les universités canadiennes, 1962-1963.

Specialty	Total	Year - Année			Spécialité
		1	2	3	
Dental public health	7	7			Hygiène dentaire publique
Oral surgery	3	1	1	1	Chirurgie buccale
Orthodontics	17	9	8		Orthodontie
Periodontics	4	2	2		Périodontie
Total	31	19	11	1	Total

TABLE 5 Dental hygienists enrolled in Canadian dental schools, 1962-1963 • Hygiénistes inscrites dans les universités canadiennes, 1962-1963.

Dental school Faculté	Total	Year-Année	
		1	2
Dalhousie	17	12	5
Toronto	88	50	38
Alberta	41	22	19
Total	146	84	62

Capacity.—The six dental schools can accommodate 332 students in each of the four dental years. In ten years the capacity of the schools has increased 64 per cent. Total capacity of the three courses in dental hygiene is 82 in each of the two

Diplômés.—En 1962, 225 étudiants ont terminé leur cours; c'est une augmentation de 29 pour cent sur l'année précédente. Des dix étudiantes qui ont obtenu leur diplôme, neuf étaient nées en dehors du pays.

Disponibilités.—Les six facultés dentaires peuvent recevoir 332 étudiants dans chacune de leurs quatre années de cours. Depuis dix ans, les disponibilités des facultés dentaires canadiennes ont augmenté de 64 pour cent. Les trois écoles qui donnent un cours pour les hygiénistes dentaires peuvent recevoir 82 étudiantes dans chacune des deux années du cours.

L'Université de Manitoba espère pouvoir recevoir sa première classe de 10 à 15 hygiénistes en septembre 1963. L'Université de Montréal fait des projets pour que ses disponibilités soient augmentées en

TABLE 6 Wastage of first year students, 1961-1962 • Pertes d'étudiants en première année, 1961-1962.

Dental school Faculté	Loss — Pertes		Reason — Raison		
	Students Etudiants	Per cent Pourcentage	Failed Echecs	Transferred Changements	Other Autres
Dalhousie	3	16.7	2	1*	
McGill	7	17.9	3	2	2
Montreal	13	21.7	13		
Toronto	4	3.3	2	2	
Manitoba	7	21.2	3	1	3
Alberta	6	12.0	4	2	
Total	40	12.5	27	8	5

*This student transferred to another dental school.
Cet étudiant a changé de faculté dentaire.

TABLE 7 Students graduating from Canadian dental schools, 1962 • Etudiants terminant leurs études dans les facultés dentaires canadiennes, 1962.

Dental school Faculté	Graduates — Diplômés			Per cent women	Foreign-born women	Per cent foreign born of all women
	Total	Men Hommes	Women Femmes	Pourcentage femmes	Femmes nées à l'étranger	Pourcentage des femmes nées à l'étranger
Dalhousie	15	15	0	0.0	—	—
McGill	36	33	3	8.3	3	100.0
Montreal	43	42	1	2.3	1	100.0
Toronto	85	80	5	5.9	4	80.0
Manitoba	14	13	1	7.1	1	100.0
Alberta	32	32	0	0.0	—	—
Total	225	215	10	4.4	9	90.0

TABLE 8 Average age of graduates from Canadian dental schools, 1962 • Moyenne d'âge des étudiants dans les facultés dentaires canadiennes, 1962.

Dental school Faculté	Average age Moyenne d'âge
Dalhousie	27
McGill	28
Montreal	26
Toronto	23
Manitoba	26
Alberta	26
Total	25

TABLE 9 Capacity of undergraduate classes, Canadian dental schools, 1962-1963 • Disponibilités des classes sous-graduées, facultés dentaires canadiennes, 1962-1963.

Dental school Faculté	Capacity - Disponibilités	
	Dental students Etudiants	Hygienists Hygiénistes
Dalhousie	25	12
McGill	40	—
Montreal	60	—
Toronto	125	50
Manitoba	32	—
Alberta	50	20
Total	332	82

TABLE 10 Capacity of classes, number of first-year students and number of graduates, Canadian dental schools, 1953-1962 • Disponibilités des classes, nombre des étudiants de 1^{ère} année et nombre des diplômés, facultés dentaires canadiennes, 1953-1962.

Year Année	Capacity Disponibilités	1st year students Etudiants de 1 ^{ère} année	Graduates Diplômés
1953-54	202	194	172
1954-55	202	211	174
1955-56	202	199	168
1956-57	205	206	186
1957-58	205	194	203
1958-59	263	250	193
1959-60	307	279	215
1960-61	327	268	174
1961-62	338	320	225
1962-63	332	332	NA*1

*Not available — Inconnu.

TABLE 11 Students admitted with advanced status to Canadian dental schools, 1962-1963 • Etudiants ayant déjà diplôme admis dans les facultés dentaires canadiennes, 1962-1963.

Country in which student graduated	Dental school — Faculté						Pays où l'étudiant a obtenu son diplôme
	Dalhousie	McGill	Montreal	Toronto	Manitoba	Alberta	
Australia				4			Australie
Brazil		1					Brésil
Egypt		1					Egypte
Great Britain				6			Grande-Bretagne
Iran					2		Iran
United States				9			Etats-Unis
European countries	1		2	7	4	3	Pays européens
Total	1	2	2	26	6	3	Total

TABLE 12 Predental university training of undergraduates enrolled in Canadian dental schools, 1962-1963. • Formation prédentaire des étudiants inscrits dans les facultés dentaires canadiennes, 1962-1963.

Dental school Faculté	Years - Années				Canadian degree Diplôme canadien		Foreign degree Diplôme étranger	
	1	2	3	4	Bachelor Baccalauréat	Other Autre	Bachelor Baccalauréat	Other Autre
Dalhousie	6	20	12	0	27	0	2	1
McGill	26	36	10	0	40	0	24	3
Montreal	0	0	0	0	169	0	2	7
Toronto	381	13	4	1	45	1	7	19
Manitoba	40	17	12	2	22	5	0	6
Alberta	94	36	10	1	28	2	3	0
Total	547	122	48	4	331	8	38	36
	Percentage — Pourcentage							
	48.2	10.7	4.3	.3	29.2	.7	3.4	3.2

For purposes of this table, predental training has been defined as training in a faculty of arts and sciences after senior matriculation or its equivalent.
 Dans ce tableau, la formation prédentaire est le programme d'étude dans une faculté d'arts ou de sciences qui suit l'immatriculation ou son équivalent.

years. The University of Manitoba hopes to be able to accept its first class of 10 to 15 student dental hygienists in September 1963. The Université de Montréal is planning an expansion program to be completed by 1967. The University of Alberta is also intending to expand the facilities of its dental school, but this program will not increase its capacity.

Residential Distribution.—The ratio of dental students to population has im-

1967. L'Université d'Alberta se propose d'augmenter les disponibilités de sa faculté dentaire, mais ces changements ne lui permettront pas de recevoir plus d'élèves.

Distribution des étudiants quant à leur domicile.—La proportion des étudiants en rapport avec la population s'est améliorée depuis un an. Cette proportion s'établit maintenant à 5.8 étudiants par 100,000 de population. Le Manitoba, pour la troisième année consécutive, a la meilleure proportion: 7.9:100,000. L'Alberta a la meilleure proportion pour l'ensemble des hygiénistes

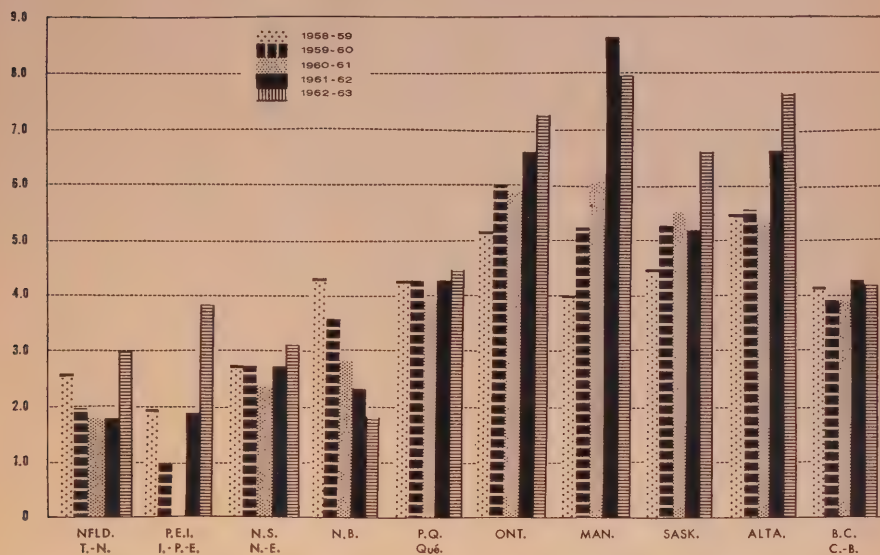


FIGURE 1 Dental students per 100,000 population, by province, 1958-62 • Nombre des étudiants dentaires par 100,000 de population, par province, 1958-1962.

TABLE 13 Graduates with prior bachelor's degree, Canadian dental schools, 1962 • Diplômés possédant baccalauréat avant études dentaires dans facultés canadiennes, 1962.

Dental school Faculté	Graduates with bachelor's degree Diplômés ayant baccalauréat	Per cent of total graduates Pourcentage du total des diplômés
Dalhousie	8	53.3
McGill	19	52.8
Montreal	41	95.3
Toronto	12	14.1
Manitoba	2	14.3
Alberta	5	15.6
Total	87	38.7

proved since last year. It is now 5.8 students per 100,000 population. For the third consecutive year Manitoba has the most favourable ratio — 7.9:100,000. Alberta has the best combined ratio of student dental hygienists and dental

et des étudiants par rapport à la population. Les quatre provinces de l'est ont la proportion la plus faible.

Les deux provinces de l'ouest qui n'ont pas de faculté dentaire (Saskatchewan et Colombie britannique) ont eu, au cours des quatre dernières années, des fluctua-

TABLE 14 Residential distribution of Canadian dental students, 1962-1963 • Endroits de résidence des étudiants dentaires de nationalité canadienne, 1962-1963.

Residence	Total	Dental school — Faculté						American schools Facultés américaines
		Dalhousie	McGill	Montreal	Toronto	Manitoba	Alberta	
Newfoundland	14	13	1					
Terre-Neuve								
Prince Edward Island	4	3					1	
Ile-du-Prince-Edouard								
Nova Scotia	23	20	1	2				
Nouvelle-Ecosse								
New Brunswick	11	10		1				
Nouveau-Brunswick								
Quebec	241	3	67	168	2	1		
Ontario	466	4	9		438	4	1	10
Manitoba	74				1	69	2	2
Saskatchewan	61		3	2	3	20	31	2
Alberta	105					1	102	2
British Columbia	70	4	7		4	7	36	12
Colombie britannique								
Canada	1,069	57	88	173	448	102	173	28

TABLE 15 Ratio of Canadian dental students to population of home province, 1958-1962 • Proportion du nombre des étudiants dentaires en rapport avec la population de leur province d'origine, 1958-1962.

Province	1958-59	1959-60	1960-61	1961-62	1962-63
Newfoundland	1/39,818	1/49,889	1/57,375	1/58,625	1/33,571
Terre-Neuve					
Prince Edward Island	1/50,000	1/102,000		1/52,500	1/26,500
Ile-du-Prince-Edouard					
Nova Scotia	1/37,368	1/37,684	1/42,529	1/36,600	1/32,435
Nouvelle-Ecosse					
New Brunswick	1/23,080	1/28,095	1/35,294	1/43,714	1/55,182
Nouveau-Brunswick					
Quebec	1/23,147	1/23,469	1/25,530	1/23,084	1/22,266
Ontario	1/19,343	1/16,533	1/17,056	1/14,816	1/13,609
Manitoba	1/24,857	1/18,830	1/16,345	1/11,544	1/12,635
Saskatchewan	1/22,200	1/18,792	1/18,200	1/19,125	1/15,246
Alberta	1/18,197	1/18,014	1/18,594	1/14,854	1/13,048
British Columbia	1/23,754	1/25,323	1/25,903	1/23,042	1/23,700
Colombie britannique					
Canada	1/22,026	1/20,544	1/21,334	1/18,615	1/17,371

students to population. The four eastern provinces have the poorest ratios.

The two western provinces still without schools (Saskatchewan and British Columbia) have had a noticeable disparity of ratios for the past four years. It will be interesting to watch the trend of

tions révélatrices de proportion. Il sera intéressant de voir comment s'établira cette proportion en Colombie britannique, quand la faculté de Vancouver aura ouvert ses portes.

Huit pour-cent de tous les étudiants des six facultés dentaires viennent de

British Columbia's ratio once the dental school in Vancouver is open.

Eight per cent of all students in the six schools are from foreign countries. Fifty Americans are at school in Canada while 28 Canadians are enrolled in dental schools in the United States. Dalhousie University has the highest proportion of out-of-province students.

Cost of Education.—The average cost of obtaining a dental education is \$6,800. This figure represents the minimum amount of money that would be spent during the four dental years as it includes only university expenses and the cost of room and board.

A recent Dominion Bureau of Statistics survey of university students' expenditures showed that it cost more to become a dentist than to learn any other profession. According to the survey, a dental student spends \$8,300 in his four years at university. This figure does not include expenses incurred during the student's pre-dental training.

pays étrangers. Il y a cinquante Américains aux études dans les facultés canadiennes; par contre, il y a vingt-huit Canadiens aux études aux Etats-Unis. L'Université de Dalhousie a la plus forte proportion d'étudiants qui ne résident pas dans la province.

Frais des cours.—La moyenne des déboursés pour un cours en chirurgie dentaire s'établit à \$6,800. Ce chiffre représente le montant minimum requis pour les quatre années d'études, car il ne comprend que les frais de scolarité et la chambre et la pension.

Une enquête qu'a entreprise récemment le Bureau fédéral de la statistique sur les dépenses qu'ont à rencontrer les étudiants des universités a montré qu'il en coûte davantage pour devenir dentiste que pour toute autre profession. Selon les chiffres du Bureau fédéral de la statistique, un étudiant dentaire dépense \$8,300, au cours de ses quatre années d'études universitaires. Ce chiffre ne comprend pas les dépenses encourues au cours des années préparatoires à l'étude de la chirurgie dentaire.

TABLE 16 Canadian dental students per 100,000 population, by province, 1958-1962 • Nombre des étudiants dentaires de nationalité canadienne par 100,000 de population, par province, 1958-1962.

Province	1958-59	1959-60	1960-61	1961-62	1962-63
Newfoundland Terre-Neuve	2.5	2.0	1.7	1.7	3.0
Prince Edward Island Île-du-Prince-Édouard	2.0	1.0		1.9	3.8
Nova Scotia Nouvelle-Écosse	2.7	2.7	2.4	2.7	3.1
New Brunswick Nouveau-Brunswick	4.3	3.6	2.8	2.3	1.8
Quebec	4.3	4.3	3.9	4.3	4.5
Ontario	5.2	6.0	5.9	6.7	7.3
Manitoba	4.0	5.3	6.1	8.7	7.9
Saskatchewan	4.5	5.3	5.5	5.2	6.6
Alberta	5.5	5.6	5.4	6.7	7.7
British Columbia Colombie britannique	4.2	3.9	3.9	4.3	4.2
Canada	4.5	4.9	4.7	5.4	5.8

TABLE 17 Residential distribution of students from outside the province in which the dental school is located, 1962-1963 • Endroits de résidence des étudiants venant d'ailleurs que de la province où la faculté dentaire est située, 1962-1963.

Résidence	All dental schools Toutes les facultés	Dental school — Faculté					Résidence	
		Dalhousie	McGill	Montreal	Toronto	Manitoba		Alberta
Other provinces of Canada	177	37	21	5	10	33	71	Autres provinces du Canada
Other countries:	93	11	51	5	23	2	1	Autres pays:
Australia	5				5			Australie
Bermuda	3	1	2					Bermudes
Brazil	1		1					Brésil
British Guiana	1		1					Guinée anglaise
Egypt	1		1					Egypte
Ghana	1						1	Ghana
Great Britain	7		1		6			Grande Bretagne
Hong Kong	3	2	1		1			Hong Kong
India	1					1		Indes
Iran	1						1	Iran
Lebanon	1			1				Liban
United States	50	6	33	2	9			Etats-Unis
Venezuela	1		1	1				Vénézuéla
West Indies	17	2	11	1	2	1		Indes occidentales
Total	270	48	72	10	33	35	72	Total
Percentage of all dental students — Pourcentage de tous ces étudiants dentaires								
Other provinces of Canada	15.6	54.4	15.1	2.8	2.1	31.7	40.8	Autres provinces du Canada
Other countries	8.2	16.2	36.7	2.8	4.9	1.9	.6	Autres pays
Both	23.8	70.6	51.8	5.6	7.0	33.6	41.4	Les deux

TABLE 18 Residential distribution of hygienists in Canadian dental schools, 1962-1963 • Endroits de résidence des hygiénistes dans les facultés dentaires canadiennes, 1962-1963.

Residence	Ratio of hygienists to dental students Proportion entre hygiénistes et étudiants dentaires	Total	Dental school — Faculté		
			Dalhousie	Toronto	Alberta
Newfoundland	1:14	1	1		
Terre-Neuve					
Prince Edward Island	1:2	2	2		
Ile-du-Prince-Edouard					
Nova Scotia	1:3	8	8		
Nouvelle-Ecosse					
New Brunswick	1:3	4	4		
Nouveau-Brunswick					
Quebec	0:241	0			
Ontario	1:5	85	2	82	1
Manitoba	0:74	0			
Saskatchewan	1:7	9		4	5
Alberta	1:3	36		1	35
British Columbia	1:70	1		1	
Colombie britannique					
Canada	1:7	146	17	88	41

TABLE 19 Dates of application, admission and graduation, Canadian dental schools, 1962-1963 and 1963-1964 • Dates pour demande, admission et graduation aux facultés dentaires canadiennes, 1962-1963 et 1963-1964.

Dental school Faculté	Freshman application 1963 Demande 1 ^{ère} année	Term — Année			
		1962-1963		1963-1964	
		Admission	Graduation	Admission	Graduation
Dalhousie	May 30 mai	Sept. 5 sept.	May 16 mai	Sept. 4 sept.	May 15 mai
McGill	Mar. 1 mars	Sept. 5 sept.	May 31 mai	Sept. 4 sept.	May 30 mai
Montreal	July 1 juillet	Sept. 5 sept.	May 31 mai	Sept. 4 sept.	May 31 mai
Toronto	Mar. 1 mars	Sept. 19 sept.	May 27 mai	NA * 1	NA * 1
Manitoba	Apr. 30 avril	Sept. 10 sept.	May 23 mai	Sept. 9 sept.	May 22 mai
Alberta	May 15 mai	Sept. 5 sept.	June 3 juin	Sept. 5 sept.	June 3 juin

*Not available • Inconnu.

TABLE 20 Financial aid available to undergraduates and graduates at Canadian dental schools, excluding government funds • Sources d'aide financière disponibles aux étudiants sous-gradués et gradués dans les facultés dentaires canadiennes (fonds du gouvernement non-compris).

Dental school Faculté	Undergraduates — Sous-gradués		Graduates — Gradués	
	Scholarships Bourses	Loans Prêts	Scholarships and/or fellowships Bourses et/ou participation à l'enseignement	
Dalhousie	yes — oui	yes — oui		
McGill	yes — oui	yes — oui		
Montreal	no — non	yes — oui	no — non	
Toronto	yes — oui	yes — oui	yes — oui	
Manitoba	yes — oui	yes — oui	yes — oui	
Alberta	yes — oui	yes — oui		

TABLE 21 Estimated cost of dental education at Canadian dental schools • Estimés du coût des études dentaires dans les facultés canadiennes.

Item	Average cost Coût moyen	Dental school — Faculté					Item
		Dalhousie	McGill	Montreal	Toronto	Manitoba	Alberta
	\$	\$	\$	\$	\$	\$	\$
Pre dental							
Tuition		930	900	425	410	325	290
Textbooks		120	100	30	50	50	125
Supplies					100	50	
Incidentals				20	60	100	
Sub-total university expenses		1,050	1,000	475	620	525	415
Room and board		1,276	1,500	1,200	600	420	600
Total*		2,326	2,500	1,675†	1,220	945	1,015
Dental							
Tuition	2,023	2,340	2,000	1,900	2,400	1,800	1,700
Instruments		1,235	1,750	1,000	620	1,200	1,136
Textbooks		260	200	200	300	350	374
Supplies	1,855	75	200	200	100	400	425
Incidentals		300	50	100	240	400	217
Sub-total university expenses		3,878	4,000	3,400	3,660	4,150	3,852
Room and board		2,876	3,305	4,000	2,400	2,000	2,400
Total	6,754	7,362	7,305	7,400	6,060	6,150	6,252
Grand total		9,688	9,805	9,075	7,280	7,095	7,267

*There is a wide variation in pre dental education costs because in some provinces it is possible to obtain one year of university credit at the high school level. Le coût de l'enseignement pré dentaire est sujet à de grandes variations dues au fait que dans certaines provinces il est possible d'obtenir des crédits pour une année universitaire dans les écoles publiques.

†A pre dental year at a faculty of arts and sciences is compulsory for admission to the Faculty of Dental Surgery, Université de Montréal, for those applicants who, through the B.A. program of the classical colleges of the Province of Quebec, would not meet the admission requirements in scientific subjects. Une année pré dentaire est imposée aux candidats qui, dans leur programme de baccalauréat en arts, n'ont pu inclure les cours dans les matières scientifiques de façon à satisfaire aux exigences d'admission à la Faculté de chirurgie dentaire de l'Université de Montréal.

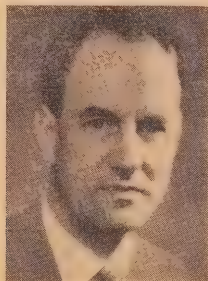
The Association

DENTAL EXPERT FROM SWEDEN TO ADDRESS C.D.A. ANNUAL MEETING

Ulf Posselt, director of the Department of Occlusal Analysis and Rehabilitation, Royal Dental School, Malmö, Sweden will present an essay on bruxism and group clinics on occlusal rehabilitation at the forthcoming convention of the Canadian Dental Association at Toronto, May 19-22. Dr. Posselt is an international authority on the subject of diagnosis and treatment of occlusal abnormalities. The Swedish dentist will also be a guest lecturer at a special two-day postgraduate course on occlusion to be given at the University of Toronto May 16-17, just preceding the convention.

Headlining the closed circuit television clinic program is J. F. Prichard of Fort Worth, Texas who will discuss surgical procedures in the treatment of periodontal pockets.

Ulf Posselt



The C.D.A. panel presentation, "The changing pattern of health services within the framework of the body politic" is another outstanding event which should attract a large audience. The three panelists are Dr. A. D. Kelly, general secretary of the Canadian Medical Association, Dr. W. G. McIntosh, a past president of the Canadian Dental

Association and current chairman of the Association's Dental Services Committee, and Mr. I. W. Outerbridge, a prominent Toronto lawyer who has had considerable experience in the medico-legal field.

Convention activities begin with a "Sunday Evening Festival," featuring music by "The Travellers," a famous Canadian Folk-singing group, as well as the ever-popular art display.

This year's art and flower exhibit is drawing a large number of entries. Dentists, members of their immediate families and their employees are entitled to submit flower displays, oil paintings, sketches, pastels, sculpture, ceramics, pottery, shell craft, leathercraft, woodwork, miniature castings, photographic enlargements, transparencies or any other handiwork in the arts and crafts for display at the art and flower exhibit of the convention. Additional information may be obtained from J. G. Dale, Canadian Dental Association headquarters, 234 St. George Street, Toronto 5, Ontario.

Early registration for the national dental convention in Toronto is urged by convention chairman J. D. Purves. Hotel reservations should be made by writing direct to Toronto hotels. Reduced rail fare certificates are available at Association headquarters.

ENCOURAGE DEVELOPMENT OF DENTAL CARE PLANS

The Executive Council recently gave approval to two means of encouraging the development of dental care plans in Canada.

1. Joint meetings on dental care plans.—The Association will share the cost (on a 50-50 per cent basis) with provincial organizations and dental service corporations sending participants to joint meetings on dental care plans. Before such a meeting can be called, a request outlining the purpose of the meeting must have been received from two or more corporate members and approved by the Association's Dental Services Committee. Members of the Dental Services Committee, one representative of each provincial equivalent of the Dental Services Committee, one representative of

each established dental service corporation, and one representative of Canadian Dental Service Plans Incorporated will be invited to attend these meetings.

2. Fund for the development of dental service plans.—To qualify for a grant to develop a dental care plan the province must have already established a dental service corporation. The Canadian Dental Association's Dental Services Committee must approve both the project to be financed and the expert personnel to be engaged in the work. When these conditions have been met, the Association will match the amount of money provided for the project by the provincial dental organization and the dental service corporation. The Canadian Dental Association will not match funds provided from sources other than those of the provincial dental organizations and dental service corporations themselves. All applications must have the sanction and approval of the respective corporate member and must be submitted by the corporate member.

C.D.A. PRESIDENT AND SECRETARY TOUR WESTERN CANADA

Canadian Dental Association president M. V. J. Keenan and secretary Don W. Gullett visited dental societies in western Canada from February 23 to March 11. Cities included in the tour were: Port Arthur and Sudbury, Ontario; Winnipeg, Manitoba; Moose Jaw and Saskatoon, Saskatchewan; Calgary, Edmonton and Red Deer, Alberta; and Penticton, Victoria and Vancouver, British Columbia.

C.D.A. STAFF DENTAL PLAN CONCLUDES FIRST YEAR

During 1962, twenty-six persons (thirteen employees, five wives and eight children) were eligible for benefits under the Association's prepaid dental care plan for headquarters staff. Twenty or 77 per cent of them utilized the services.

In the first year of the plan's operation, the employees and their dependants received dental services amounting to \$1,407. Of this, \$696.20 was paid by the plan. The average cost per person seeing a dentist was \$70.35. The average cost to the Association per employee was \$53.55.

A wide range of services was received during the year. Orthodontic treatment accounted for 51 per cent of the plan's expenditures and fixed bridgework for 23 per

cent. Preventive services took only 15 per cent of the total amount spent by the plan.

If premiums were calculated on the basis of last year's experience they would be \$35 a year for single employees, \$70 a year for married couples, and \$105 a year for families.

At its February meeting the Executive Council approved several changes in the plan. This year, two routine oral examinations will be covered instead of one, the deductible for basic dental benefits will be reduced to \$10 and the maximum that the plan will pay will be raised to \$300 for individuals and \$750 for families.

Canada and the Provinces

NEW DRUG SAMPLE REGULATIONS RECOMMENDED

Royal assent was recently given by the Governor General to Bill C.3, an Act to amend the Food and Drugs Act. In it there is a section authorizing the Governor-in-Council to promulgate regulations respecting the distribution or the conditions of distribution of samples of any drug. Under the authority of this new section it is proposed to recommend to the Minister of National Health and Welfare that the Food and Drug Regulations be amended by the addition of the following:

C.01.048. Subject to Section C.01.307 and to Part G of the Regulations, a person may distribute a drug as a sample under the following conditions:

(a) The person to whom the drug is to be distributed as a sample is a physician, dentist, veterinary surgeon or pharmacist who is registered and entitled to practise his profession in a province of Canada.

(b) The person distributing a drug as a sample shall, in respect of each sample thereof, first receive an order in writing signed by the physician, dentist, veterinary surgeon or pharmacist to whom the sample is to be distributed, specifying the name and the quantity of the drug requested.

(c) The person distributing a drug by way of a sample shall maintain records showing (1) the name, address and description of each person to whom a sample of a drug was sent; (2) the name, quantity and form of the said drug; (3) the date the said drug was supplied; and the person supplying a drug by way of a sample shall maintain such records, including the written orders so received, for a period of two years and

shall permit access thereto by the Minister or his designated representative upon request.

C.01.049. No person shall distribute a drug as a sample unless the label thereof carries all the information required by these regulations.

DOMINION BUREAU OF STATISTICS REVEALS CHARACTERISTICS OF DENTAL STUDENTS

A recent Dominion Bureau of Statistics survey of university students' expenditures and income has brought many interesting facts about dental students to light.

Total expenditures for dentistry students in the academic year 1961-62 were \$1,542 for single students living at home, \$2,064 for single students living away from home and over \$3,000 for married students. In each of these three categories, dental students spent as much as or more than students in medicine, law, pharmacy, engineering, arts, science, commerce, and education.

The D.B.S. *Daily Bulletin* reported that "Home residence for almost 45 per cent of all undergraduate students was in cities of more than 100,000 population. Law had the highest proportion of students from such centers (58.8 per cent of total law students), followed by medicine (55.8 per cent), and dentistry (53.8 per cent). The lowest proportion was found among education students (30.8 per cent). Slightly more than 8 per cent of all undergraduate students came from farms." Dentistry had the second lowest proportion of students from farms—5.9 per cent.

Ninety-one per cent of all dental students had summer jobs in 1961; 12.6 per cent postponed entrance to, or withdrew from university at some time because of shortage of funds. The percentage of married dental students (31 per cent) is greater than the percentage of married students in other faculties. The proportion of women in dentistry is lower than in any other faculty except engineering.

PRINCE EDWARD ISLAND DENTIST APPOINTED TO SENATE

Prime Minister Diefenbaker announced on February 5 the appointment to the Senate of O. H. Phillips, a member of Parliament for Prince Edward Island. Dr. Phillips graduated from the Faculty of Dentistry at Dalhousie University in 1952.

NATIONAL DENTAL HEALTH DAY APRIL 3

National Dental Health Day in Canada this year was observed on April 3. The date occurred during the week of April 1-7 which was sponsored by the Health League of Canada as National Health Week. Local television stations which carry the children's program, "Romper Room," co-operated with dentists in various centres by arranging special programs to mark the event.

International Items

F.D.I. MEETING SCHEDULED IN STOCKHOLM

The capital of Sweden will be the site of the 51st annual session of the Fédération Dentaire Internationale, July 1-7, 1963. Thus the Federation returns to this city of waterways and bridges after an absence of 16 years.

The organizing committee, under the chairmanship of H. Berggren, is preparing a varied program, including visits to places of interest, an opera performance and excursions.

The broad outline of the program is as follows: Sunday, June 30: General Assembly A; Monday, July 1: Opening Ceremony and Scientific Program; Tuesday, July 2: Scientific Program; Wednesday, July 3: Scientific Program and Banquet in the Stockholm City Hall; Thursday, July 4: All-Day Tour of Stockholm's archipelago; Friday, July 5: Scientific Program and performance at the Drottningholm Court Theatre; and Saturday, July 6: General Assembly B.

Proposed themes for the scientific program are: Biological Aspects of Prosthetic Dentistry; Oral Health of the Aged; and Microbiology of Periodontal Disease.

The scientific program and business meetings will be held in the recently completed A.B.S. Building in the heart of Stockholm. Fine lecture halls, spacious exhibition rooms, a restaurant, a café, and all the amenities which contribute to an enjoyable meeting are to be found in this building. Simultaneous translation will be provided in English, French and German. After the meeting there will be an organized air tour of the

ancient city of Visby on the Isle of Gotland in the Baltic Sea. Visby is an ancient cultural centre, with many interesting historical monuments dating from the middle ages, as well as a delightful holiday centre. Also planned is a night tour by air to Lapland—the land of the midnight sun—north of the Arctic Circle.

Canadian dentists planning to attend the *Fédération Dentaire Internationale* meeting in Stockholm and those planning to attend other meetings abroad, are invited to join the Federation as supporting members. The F.D.I. now represents 63 national dental organizations with a total membership of approximately 250,000 dentists. Supporting F.D.I. membership entitles the dentist to receive both the *F.D.I. News Letter* and the *International Dental Journal* as well as a certificate of membership suitable for framing. There is also a reduction in the enrolment fee at all F.D.I. meetings.

FLUORIDATION NEWS FROM AROUND THE WORLD

The Corporation of the City of Dublin, capital of the Republic of Ireland, recently voted to authorize the expenditure of £11,000 for fluoridation of that city's water supply.

The incidence of dental caries in six-year-old children of Austin, Minnesota has increased following the discontinuation of fluoridation of that community's water supply. Austin began to fluoridate its drinking water in 1952, but discontinued the measure in April 1956. Because of fluoridation, the six-year-old children in 1957 showed a 70 per cent reduction in caries, as compared with the DMF rate in six-year-old children in 1952. The trend now indicates that the DMF rate is returning to the original rate of 1952.

Lansing (Michigan), Greenfield (Iowa), Shenandoah (Iowa) and Stafford (Kansas) are among communities in the United States which recently voted to institute fluoridation.

Kilmarnock, Scotland recently decided to discontinue fluoridation after an experimental scheme had been in operation there for five years. Despite the fact that the British Government's report on fluoridation showed that substantial improvement had been effected in the teeth of children of this area, and the fact that thirty-two out of the thirty-four local physicians signed a letter

recommending the continuation of fluoridation, the opponents of fluoridation on the town council won the day. Local observers hope that this is only a temporary setback.

A ten-year old fluoridation study at Norrköping, Sweden, discontinued last year by order of Sweden's Supreme Administrative Court, has been granted a five-year extension by a special amendment to Sweden's Health Act. This amendment permits communities with adequate water works controls to fluoridate their drinking water with the consent of the Royal Medical Board in Stockholm.

Fluoridation is being accepted as an effective and economical method of caries control in Latin America. Many municipalities now employing alum coagulation for water treatment may initiate fluoridation by utilization of fluorspar which is found in several South American countries. Although water fluoridation is the best method at present available for mass approach to fluoridation, it is not available to those segments of the population who do not use water from a public supply system. There is, therefore, an interest in alternative methods of fluoride supplementation in the diet for use where water fluoridation is not feasible. Salt fluoridation holds promise of being the cheapest method for wide-scale supplementation of fluorine in the diet. This method is at present being used extensively in Switzerland, but no controlled studies have yet been made to demonstrate its effectiveness. A proposed World Health Organization project in the Americas will assist in a study on salt fluoridation. Provision has been made for supplies and equipment and research funds are being requested from other sources to carry out detailed studies.

NEW EDITOR-IN-CHIEF FOR AMERICAN DENTAL ASSOCIATION

L. C. Hendershot of Chicago has been appointed editor-in-chief of the American Dental Association, succeeding L. W. Morrey, who retired after almost thirty years' service with the Association. Dr. Hendershot's appointment became effective on January 1 of this year. He joined the American Dental Association staff in 1959 as assistant secretary of the Council on Dental Therapeutics, and was appointed assistant editor in March 1962. Dr. Hendershot is a graduate in dentistry from the University of Michigan. He also received a Ph.D. degree in pharmacology from that university, where he served as

research assistant, research associate and lecturer in pharmacology. Prior to joining the American Dental Association's staff he conducted laboratory research at the Dow Chemical Company, Midland, Michigan.

ORAL PATHOLOGY AND PERIODONTOLOGY CONFERENCE IN MASSACHUSETTS

The 14th Annual Berkshire Conference in Periodontology and Oral Pathology will be held from June 16 to 20 in Lenox, Massachusetts, it was recently announced by Tufts University which sponsors the conference. The conference is open to general practitioners as well as specialists. Further information and application forms may be obtained by writing to: Tufts Berkshire Conference, Tufts University School of Dental Medicine, 136 Harrison Avenue, Boston 11, Massachusetts.

Dental Organizations

MOUNT ROYAL DENTAL SOCIETY HOLDS CLINICAL MEETINGS

Films demonstrating oral rehabilitation procedures following periodontal treatment and showing a comparison of sprays and chuck concentricity of various handpieces were featured at the fourth general meeting of the Mount Royal Dental Society on January 14.

A. I. Chasens was the lecturer at an all-day clinic devoted to the effects of traumatic occlusion on the periodontium, for the fifth general meeting on January 25. Stressing the need for satisfactory radiographs and functionally mounted casts to note wear patterns and diastemata, Dr. Chasens discussed the procedure of scaling to reduce inflammation, followed by occlusal correction. Once centric occlusion has been established it must not be altered, Dr. Chasens said. Abnormal wear of the teeth alone is not sufficient reason for grinding them, he added. Dr. Chasens does, however, make adjustments for loose teeth and food impaction. Attention was also paid to plunger cusps, uneven marginal ridges, and restorations of poor anatomical form.

Dr. Chasens discussed temporomandibular joint problems and the use of night guards to alleviate pains in the temporomandibular joint. Minor tooth movement by means of removable appliances, in preparation for the placement of permanent restorations, were amply illustrated with coloured slides.

PLAN FUND-RAISING CAMPAIGN FOR DENTAL EDUCATION IN ALBERTA

A major campaign to raise funds in support of dental education of the University of Alberta is to be launched by the Foundation for Education (Alberta). The initial appeal will be made to the dental profession and future plans include an additional appeal to private business firms.

District representatives from all parts of the province recently met with J. M. Calvert of Edmonton, president of the Foundation, to plan the province-wide campaign. The goal of the fund raising drive is \$100,000 to be raised over a period of five years.

District chairmen are R. B. Burgman of Blairmore, G. C. Swann of Calgary, C. A. White of Red Deer, W. Scott Hamilton (dean emeritus of the Faculty of Dentistry, University of Alberta) of Edmonton, G. L. McMurray of Beaverlodge, L. G. Mandin of St. Paul, J. C. Ward of Edmonton, and L. N. Kjørven of Eston, Saskatchewan, representing the province of Saskatchewan.

LAKEHEAD DENTISTS NAME NEW EXECUTIVE

A. E. Ward of Fort William has been elected president of the Thunder Bay Dental Association for 1963. Dr. Ward is director of Dental Public Health Services for the Fort William-Port Arthur Health Unit.

Elected to the executive with Dr. Ward were W. W. Dowhos of Port Arthur, vice president; B. F. Turner of Fort William, secretary; R. A. Laine of Port Arthur, treasurer; and S. P. Smith of Port Arthur, immediate past president.

VANCOUVER HOME TALENT CLINICS WELL ATTENDED

There was a record attendance of 238 dentists at the home talent clinics of the Vancouver and District Dental Society on February 9. Half of the presentations were made in the

morning and the remainder were presented after the official luncheon.

The clinicians were: K. W. McCann, G. R. Young, the B. C. Society of Oral Surgeons, C. J. Liebe, A. F. Rader, W. L. Elliott, H. J. Kaplowitz, R. J. Dent, M. P. Warshawski, H. J. Killas, R. J. Warshawski, W. J. Chambers, S. R. Kirson, J. C. Friedman, A. H. L. Campbell, D. B. McDonald, O. Bokstrom, N. R. Wright, R. B. McAlpine, L. R. Bowlsby, J. F. Reid, D. H. Warren, K. E. Murchie, A. J. S. Prothero and W. R. Upton.

At the luncheon meeting an honorary membership in the society was conferred on S. Wah Leung, dean of the U.B.C. dental faculty at the University of British Columbia. Dr. Leung spoke at some length on the progress made in establishing the new dental school.

JOINT MEETING OF MONTREAL DENTAL GROUPS

"Clinical hints in operative dentistry" and "Splints, their indications and applications" were the topics of the second joint meeting of the Société Dentaire de Montréal, Mount Royal Dental Society, and Montreal Dental Club held on February 18 at the Queen Elizabeth Hotel. P. G. Anderson, professor of operative dentistry and director of the Dental Clinic at the University of Toronto was the guest clinician. During the afternoon presentation, Dr. Anderson discussed the preparation and retention of inlays for anterior teeth as well as the handling of various elastic impression materials. The evening presentation was devoted to a consideration of splinting in connection with accident cases and periodontal treatment, removable cast splints, and fixed splints.

VANCOUVER DENTAL ASSISTANTS' COURSE BEGINS IN SEPTEMBER

The College of Dental Surgeons of British Columbia in co-operation with the Vancouver School Board has completed arrangements for a course for dental assistants to be held in the Vancouver Vocational School. The course begins in September with a small pilot group as the first class. The starting dates will be staggered so that dental assistants will graduate in small numbers every four months. Thus the Vancouver area will not be flooded with a large group of graduates once a year. To qualify, candidates must have grade twelve educational standing. Typing and commercial courses are consid-

ered a good background, and individual qualities will be an important consideration in selecting candidates. The course will last for eight months, five full days a week. This will be a recognized training program, and a certificate will be issued to those who successfully complete the course.

Canadian Dental Schools

UNIVERSITY OF BRITISH COLUMBIA

New Staff Appointment. — G. J. Parfitt, L.R.C.P., M.R.C.S., F.D.S., D.M.D. has been appointed the first department head in the Faculty of Dentistry at the University of British Columbia. Dr. Parfitt will head the Department of Oral Medicine at the Faculty of Dentistry, University of British Columbia which plans to enrol its first class of students in 1964. He comes to British Columbia from the University of Alabama.

Born in Reading, England, Dr. Parfitt completed undergraduate training in medicine and dentistry at Guy's Hospital in London and carried out postgraduate work in Dublin, Ireland.

Dr. Parfitt was associated with Guy's Hospital from 1935 until 1949 when he was named senior lecturer and head of the preventive dentistry department in the Institute of Dental Surgery, British Postgraduate Medical Federation, London. He went to the United States in 1955 where he joined the faculty of the University of Alabama School of Dentistry.

UNIVERSITY OF TORONTO

Dr. Grainger to Head International Committee on Dento-Facial Anomalies. — A Canadian statistical expert has been requested to act as chairman of an international committee charged with bringing in recommendations on procedures for recording handicapping dento-facial anomalies. The request, from the Special Commission on Oral Statistics of the Fédération Dentaire Internationale, went to R. M. Grainger, professor of Dentistry (Statistics) at the University of Toronto. Three co-workers named on Dr. Grainger's committee are Professor Besombes of Paris, H. Draker of U.S.A., and Professor Bijlstra, a prominent European orthodontist.

Dr. Woodside Joins Tweed Foundation for Orthodontic Research.—D. G. Woodside, professor and head of the Department of Orthodontics, University of Toronto, has recently accepted an invitation to join the teaching staff of the Charles H. Tweed Foundation for Orthodontic Research, Tucson, Arizona on a visiting basis. Dr. Woodside will participate in the foundation's seminar for two weeks in October of this year.

Refresher Course for School of Hygiene.—The Faculty of Dentistry provided a complete program for the second day of the sixth annual refresher course for public health personnel given under the auspices of the Division of Postgraduate Medical Education, in the School of Hygiene, February 4-8, 1963. Ninety-one candidates registered for this refresher course. They included medical health officers, practising physicians, dentists, veterinarians, nutritionists, bacteriologists, virologists, nurses, sanitarians and public health workers.

Varsity Fund Grant for Burlington Orthodontic Research Data.—A grant of \$6,000 has been allocated from the Varsity Fund to assist in providing permanent housing for the data accumulated at the Burlington Orthodontic Research Centre during the past ten years. This material, which is unique in many respects, has attracted world-wide interest among research workers. During the past year, for example, data from Burlington was used by staff and graduate students in diverse areas such as anatomy, surgery, orthodontics, anthropology and genetics. Several requests have been received from universities in the United States and Canada asking permission to use the Burlington data.

Members of the Dental Alumni Association of the University of Toronto contribute to the Varsity Fund, and the Faculty has expressed its gratitude to the Alumni and the Varsity Fund for this timely donation.

Royal Canadian Dental Corps

INSPECTION TOURS AND VISITS

Brigadier K. M. Baird, Director General of Dental Services for the Canadian Forces commenced an inspection tour of No. 15 Dental Company, Quebec Command, with headquarters in Montreal, during February.

Accompanied by Lt.-Col. J. G. Butler, Commanding Officer of No. 15 Company, he visited clinics in Quebec City, Camp Valcartier and R.C.A.F. Station, Goose Bay, Labrador.

Col. G. B. Shillington, Deputy Director General of Dental Services visited the R.C.D.C. School at Camp Borden, Ontario recently to interview personnel attending courses and to confer with the Commandant, Col. C. E. Purdy. This visit to Camp Borden was immediately preceded by Col. Shillington's attendance at the American Denture Society meetings held in Chicago, February 1-5.

Lt.-Col. D. H. Hillier represented the Director General at the February 6 meeting of the editorial board of *Oral Health* magazine at Toronto.

DENTAL OFFICERS UNDERTAKE EXTENSION COURSES

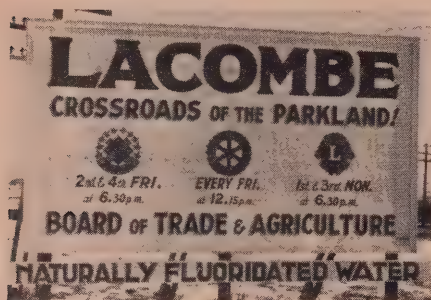
Professional education in the Corps has been expanded through the courtesy of the U.S. Navy Dental Corps in making available to officers of the Royal Canadian Dental Corps the professional extension courses conducted by the U. S. Naval Dental School at Bethesda, Maryland. These courses are available in several subjects and consist of a series of assignments which are based on reference material provided.

Twenty-six R.C.D.C. officers are currently enrolled and three others have received certificates denoting their completion of courses in endodontics and oral diagnosis. The successful officers are: Capt. W. E. Gazo—oral diagnosis; Capt. L. C. Gray—endodontics; and Capt. J. F. A. Marcil—endodontics.

COURSE ATTENDANCES

Two casualty care and clinical dentistry courses for officers have been held this winter at the R.C.D.C. School, Camp Borden. Attending from January 21-February 15 were: Lt. Col. W. W. Anglin—R.C.A.F. Station, St. Jean, P. Quebec; Lt. Col. C. M. Cornish — R.C.A.F. Headquarters, Ottawa, Ontario; Major Quince Davis—U.S. Army (D.C.); Major P. E. Fafard—Fort Churchill, Manitoba; Major D. E. McDermott—Camp Gagetown, New Brunswick; Major R. J. K. Pyne—R.C.A.F. Station, Comox, British Columbia; and Capt. W. A. Sugars—R.C.A.F. Station, St. Hubert, P. Quebec.

The second series of courses commenced March 4 and ran to April 5. Attending were: Major J. D. Bourque—Camp Valcartier, P.



Another community to erect a sign announcing that its water supply is fluoridated is the town of Lacombe in the province of Alberta.

Quebec; Major J. C. Brick—R.C.A.F. Station, Uplands, Ontario; Major E. M. C. Franklin—R.C.A.F. Station, Centralia, Ontario; Major J. I. Goddon—R.C.A.F. Station, St. Hubert, P. Quebec; Major J. Schmitz—U.S. Army (D.C.); and Major J. J. Walker—R.C.A.F. Station, Cold Lake, Alberta.

Major R. A. Fell of R.C.A.F. Station, Goose Bay, Labrador attended a course in periodontics at the U.S. Naval Dental School, Bethesda, Maryland, from February 25 to April 19.

Public Health

ONTARIO PUBLIC HEALTH DENTISTS MEET

Members of the Ontario Association of Public Health Dentists met in Toronto, February 1 to review a number of questions of professional concern. Included on the agenda were the following items: question of specialty status for dental public health within the Canadian Dental Association, associate membership within the dental section of the Ontario Public Health Association for dental hygienists and dental clinicians, and recruitment of public health dentists.

book reviews

CLINICAL PAEDODONTICS

S. B. Finn, ed. Ed. 2. Philadelphia and London, W. B. Saunders Co., 1962. (Available from McInsh & Co. Ltd., Toronto and Vancouver) 740 p. illus. \$15.70

In general this is a good book; the context is rather well arranged and the outline as a whole gives a view of what paedodontics is and should be.

However, some points of criticism might be noted. No paedodontic textbook, today, should be without a concise chapter on physical and mental growth, and Finn's text is lacking in this respect.

It might be advantageous if the chapter on emotions were developed in broader terms — what are emotions?, why do they occur?, how are they triggered?, where do

they stem from?, can they be directed?, etc. — before introducing specific problems related to dentistry. The whole picture should be drawn in bold strokes; once the picture is fully assembled, a particular component (fear in this case) can be detached and further amplified.

The same criticism applies to the chapter on oral habits. The origin, course, transfer, environment, and need for correction if necessary, etc., should be discussed first. Then details about specific habits should follow as required.

The appliance (sharpened pitchfork) illustrated on page 319 stems from barbaric times and has no place in modern health service.

The book would probably gain by a rearrangement of the sequence of certain chapters. For example, chapter 4 dealing with

the Morphology of the Primary Teeth might logically precede chapter 8 dealing with Operative Dentistry in Primary Teeth.

Some chapters are excessively long. For example, the description of certain routine procedures in chapter 10 (Pulp Treatment and Endodontic Therapy) and chapter 17 (Oral Surgery for Children) can be found quite easily in books devoted to endodontics and oral surgery. On the other hand, a separate chapter on hospital procedures and general anaesthesia as applied to children's dentistry would certainly have helped to focus attention on this important service.

The context of the book with the exception of some minor changes is essentially the same as in the first edition.

Writing a book is no easy task; however, subsequent editions should reflect an effort toward achieving a new outlook, whether this be the remodeling of standard ideas, the insertion of new material, or the elimination of old concepts.

J. G. Perreault

MATERIALS IN DENTISTRY

R. H. Roydhouse. Chicago, Year Book Medical Publishers, Inc., 1962. 210 p. Illus. \$4.75

This booklet does not take the place of texts on the subject of dental materials by such authors as Skinner and Phillips, or Peyton and associates. It is a condensed coverage of the subject.

An attempt to reduce and simplify the discussion of the physical sciences has been made. General comments on the results of research in this field give the reader a summary of the latest advances and suggestions regarding where improvements may be expected.

The booklet contains less than two hundred pages and is excellent for anyone wishing to read a synopsis of the subject.

W. J. Ross

PRACTICAL EXERCISES IN ORTHODONTICS

F. G. Shaw and S. Edmondson. London, Henry Kimpton, 1962. 152 p. Illus. £2 2s 0d.

The authors of this book, which is a laboratory manual, are, respectively, a fellow and a licentiate of the Institute of British Surgical Technicians. They are also lecturers at the Matthew Boulton Technical College, Birmingham, England.

The material is presented in two parts. Part One deals with removable orthodontic appliances and Part Two, with fixed appliances. Each part provides brief introductory remarks of a general nature but consists mainly of a series of exercises, twenty-four in number in Part One, and twelve in Part Two.

Each exercise is a precise, sequential instruction for the construction of one of the selection of orthodontic appliances. Preceding such details are some general remarks concerning the appliance and information regarding its use, sufficient to give orientation without suggesting that a "diagnosis" be made by the technician.

Part One is the larger of the divisions. Aside from considering the manifold designs made possible by the effective retention of the Adams crib, this part also describes the construction of the oral screen, the bite plane, the Andresen appliance, etc.

Part Two emphasizes the fixed lingual arch, with lesser consideration given to the labial arch and the twin-wire arch.

The illustrations are profuse and clear, mainly photographic but supplemented by diagrams where necessary.

An exhaustive index has been made and a glossary of orthodontic terms is appended.

A table providing the dimensions of wire and tape used in various appliances might be improved by giving the dimensions in inches as well as in millimetres.

The authors state in the preface that they hope the volume "will be found of value to dental technicians who find themselves confronted with the technicalities of orthodontic problems." There is no doubt that this hope is well-founded. In addition, the reviewer feels that the orthodontist cannot fail to find in this book some technical ideas which will be useful supplements to his adopted procedures.

P. S. Christie

ACCEPTED DENTAL REMEDIES, 1963

Council on Dental Therapeutics, American Dental Association. Ed. 28. Chicago, American Dental Association, January 1963. 212 p. \$3.00

This annual publication still represents the best investment for a dentist who wishes an up-to-date reference book on drugs for his office. The significance of drugs currently administered in medical practice and their effect on diagnosis and treatment planning by the dentist is particularly valuable. There is increasing recognition and appreciation

by patients of the contribution which dentistry makes to total health care.

This concise book is one, which unlike many textbooks, attempts to evaluate the usefulness of a drug in dentistry. This feature alone makes its acquisition worthwhile.

C. Reynolds

FUTURE REQUIREMENTS OF DENTAL MANPOWER AND THE TRAINING AND UTILIZATION OF AUXILIARY PERSONNEL

Proceedings of the Workshop. The University of Michigan, W. K. Kellogg Foundation Institute, Graduate and Postgraduate Dentistry. 206p.

From January 15-19, 1962, a workshop conference was presented by the University of Michigan in conjunction with the W. K. Kellogg Foundation Institute, Graduate and Postgraduate Dentistry. The *Proceedings* are an edited documentation of the fifteen papers presented to the conference, the reports of the eight evaluating committees, and the discussions which ensued at the time of presentation of the evaluating committee reports.

In view of the significant interest which at present pertains in respect of the possible future role of auxiliary services in dentistry, this report, comprising approximately two hundred pages, should be reading of consummate interest to most members of the profession.

All fifteen papers are certainly worth reading, but two, particularly, are possessed of more than usual interest. "The Impact of Sociological Trends on the Health Professions" by George Bugbee and "The Philosophy of the Medical Profession toward the Utilization of Auxiliary Personnel" by A. N. Taylor were particularly well received by the conference.

As with most other groups who have discussed this subject, there was really no disagreement on basic principles — only on methods of implementation. Without dissenting vote, the following principle was adopted: "It should be a guiding principle in professional pursuits that wherever possible and feasible, personnel of superior training should not routinely be performing procedures which can, with comparable effectiveness, be performed by those of lesser training to whom such procedures have been delegated under the responsible supervision and control of the fully qualified professional person." Wide differences of viewpoints were offered, however, when deliberations considered how this principle could best be effected.

There was also no dissenting vote to the statement "that there are no valid reasons which should exclude any person, on the basis of sex alone, from being a dental auxiliary." Albeit, when the matter of whether male auxiliaries should be officially countenanced came to a vote, thirty-seven were in favour while thirty-three were opposed.

Unquestionably, the deliberations and conclusions of this conference will be possessed of great pertinence for any segment of the profession giving consideration to the future role and training of auxiliary personnel. Virtually every consideration indigenous to the subject has been covered in great depth and the availability of this resource material in the printed *Proceedings* should be of inestimable value.

W. J. Dunn

DOCTOR AND PATIENT AND THE LAW

C. J. Stetler and A. R. Moritz. Ed. 4. St. Louis, Mosby, 1962. 529p. \$14.75

It is difficult to assess, with any precision, the value of a book written in the United States on the subject of legal medicine in respect of its applicability to Canadian jurisprudence. It is obvious, however, that many of the principles enunciated apply with equal validity to both countries.

The book is written in four parts: rights and duties of physicians; rights and responsibilities — patients and physicians; medical testimony; medical professional liability.

Although written expressly for members of the medical profession, there is direct applicability, except for those procedures which are entirely medical in context, to dentistry and the text may be judiciously perused by dentists with significant value accruing to them. One very practical contribution the book makes is the provision of forms for various purposes such as consent for treatment, consent to be photographed, consent for the utilization of photographs in the scientific literature and matters of a like nature. The book, too, is especially valuable in dealing with medical professional liability (malpractice), and here the principles enunciated apply with equal force and effect to dentists whether they live in the United States or in Canada.

While it is possible that this text may not find its way into the libraries of individual dentists, the book should be considered a necessity for any dental school or dental association library.

W. J. Dunn

additions to the library

- BREGSTEIN, S. J. Handbook for dental assistants, hygienists and secretaries. Englewood Cliffs, N.J., 1961. 364 p. \$8.25
- CLUTE, K. F. The general practitioner; a study of medical education and practice in Ontario and Nova Scotia. Toronto, University of Toronto Press, 1963. 566 p. \$12.00
- EUROPEAN ORTHODONTIC SOCIETY. Report of the 37th Congress held at Bologna, Italy, September 7-11, 1961. 511 p. illus. \$15.50
- HEALEY, H. J. Endodontics. (Practical Dental Monographs, January 1963.) 35 p. illus.
- LEE, J. H. Dental aesthetics: the pleasing appearance of artificial dentures. Bristol, John Wright & Sons Ltd., 1962. 159 p. illus. \$9.00
- LINKOW, L. I. Full arch fixed oral reconstruction simplified. New York, Springer Publishing Company, Inc., 1962. 336 p. illus. \$20.40
- MARTINI, DR. A. Polyoma microbico (studio sperimentale). Arezzo, Italia, Sansepolcro, 1962. 96 p. illus.
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in memoriam

ROY MELVILLE ANDERSON — Dr. R. M. Anderson of Toronto died on January 21, 1963. He was 68. Dr. Anderson was born in Bracebridge, Ontario in 1894. He graduated from the Royal College of Dental Surgeons of Ontario in 1916. Dr. Anderson served as a missionary in Chungking, China from 1920 until 1939 and with the Royal Canadian Dental Corps from 1939 to 1946. Thereafter he practised in Toronto

until 1960. In 1960 he joined the staff of the Ontario Hospital where he remained until his retirement in 1962. Dr. Anderson is survived by his wife, Jenny May; three daughters, Mrs. W. Nolan and Mrs. R. J. Wilson of Toronto and Mrs. W. J. Chittick of Gravenhurst; and two sons, J. Ryerson Anderson of Toronto and G. W. Anderson of London.

ALLAN MacGREGOR BAYNE — Dr. A. M. Bayne of Norwich, Ontario died on January 12, 1963. He was 61. Dr. Bayne was born in Newbury, Ontario in 1901. He received his early education in Chatham, Ontario and graduated from the Royal College of Dental Surgeons of Ontario in 1924. Dr. Bayne practised in Alvinston, Ontario and St. Marys, Ontario from 1924 until 1932 when he went to Norwich where he practised until his death. Surviving are his wife, Florence J.; a daughter, Mrs. J. R. Wilson of Sarnia; and one son, Robert A. Bayne of Timmins.

LEONARD ROY BRADEN—Dr. L. R. Braden of Ottawa, Ontario died on February 21, 1963. He was 62. Dr. Braden was born in Calabogie, Ontario in 1901. After graduation from the Royal College of Dental Surgeons of Ontario in 1927 he practised in Osgoode, Ontario until 1931. He then went to Ottawa where he practised until the time of his death. Dr. Braden is a former secretary of the Ottawa Dental Society and was president of the Ontario Dental Association in 1955. Besides his wife, Elaine Fraser, he is survived by one daughter, Mrs. Jane Jarman of Ganges, British Columbia and two sons, Dr. Richard J. Braden and John Alan Braden of Ottawa.

ANDREW PATRICK BRENNAN — Dr. A. P. Brennan of Timmins, Ontario died on January 7, 1963. He was 65. Dr. Brennan was born in Sheenboro, P. Quebec in 1897. He received his early education at St. Michael's College in Toronto, and after graduating from the Royal College of Dental Surgeons of Ontario in 1923 he practised in Timmins. He is survived by his wife, Evelyn A.; two sons, Andrew Brennan of Streetsville, Ontario and Donald Brennan of Timmins; and a daughter, Joan Brennan, R.N. of Toronto.

GEORGE HOLLIS BROWN — Dr. G. H. Brown of Edmonton, Alberta died on January 19, 1963. He was 63. Dr. Brown was born in Kings County, Nova Scotia in 1899. He graduated from the University of Alberta in 1930 and practised in Edmonton. He is survived by his wife, Lavina; two sons, Rudolph Brown and Harold Brown of Edmonton; and two brothers, Dr. H. K. Brown of Ottawa and Howard Brown of The Pas, Manitoba.

WILLIAM FOTHERGILL DEWAR — Dr. W. F. Dewar of Toronto, Ontario died in December 1962. He was 56. Dr. Dewar was born in Milton, Ontario in 1906. He graduated from the University of Toronto in 1930. After practising in Florence, Italy from 1930 until 1931, he returned to Toronto where he practised until his death.

ALFRED WILSON DYER—Dr. A. W. Dyer of Hamilton, Ontario died on January 17, 1963. He was 67. Dr. Dyer was born in Barrie, Ontario in 1895. After graduation from the Royal College of Dental Surgeons of Ontario in 1924 he practised in Barrie, Ontario. Dr. Dyer then went to Hamilton where he was connected with the Hamilton General Hospital. He is survived by his wife, Bessie Cairns; a daughter, Holly Ann Dyer; one sister, Mrs. R. R. Morley; and three brothers, William Dyer and Elmer Dyer of Barrie, Ontario and Dr. H. F. Dyer, Hamilton.

CLARENCE ELI EASTWOOD — Dr. C. E. Eastwood of Edmonton, Alberta died on December 29, 1962. He was 76. Dr. Eastwood was born in Cornwall, Ontario in 1886. After graduating from the Royal College of Dental Surgeons of Ontario in 1910 he went to Edmonton where he practised until his recent illness. Dr. Eastwood had served at one time as president of the Edmonton and District Dental Society. He is survived by one daughter, Mrs. J. C. Moon, and two sons, Jack Eastwood and Dr. B. J. Eastwood, as well as twelve grandchildren, all of Edmonton.

LOUIS SAMUEL EIDINGER — Dr. L. S. Eidinger of Montreal, P. Quebec died on February 9, 1963. He was 68. Dr. Eidinger was born in Roumania in 1894. He graduated from McGill University in 1920. Dr. Eidinger was a charter member and past president of the Mount Royal Dental Society and was honoured with a life membership in 1955. He organized the dental department of the Hebrew Old Peoples' Home and was actively associated with the Mount Sinai Sanatorium for over forty years where he was serving as president at the time of his death. Dr. Eidinger was also president of the Council of Jewish Health Agencies of Montreal. Besides his wife he is survived by two sons, Dr. Stanley L. Eidinger and Dr. Martin Eidinger;

one daughter, Mrs. Barry Simon of New York; a brother, Joseph Eidinger; a sister, Mrs. Abe Solomon of Detroit; and eight grandchildren.

GEORGE THOMAS LEIGHTON—Dr. G. T. Leighton of Moncton, New Brunswick died on January 1, 1963. He was 80. He was born in Lower Derby, Northumberland County, New Brunswick in 1882. Dr. Leighton graduated from the University of Baltimore in 1904. He is survived by his wife, Blanche; one daughter, Mrs. R. A. Salmoni of Kingsville, Ontario; two sons, Dr. Claude M. Leighton and F. Keith Leighton of Moncton; two sisters, Mrs. W. U. Appleton of Sussex and Mrs. Frank Dobie of Victoria, British Columbia; and nine grandchildren.

NORMAN STANLEY MACDONALD — Dr. N. S. Macdonald of Calgary, Alberta died on November 24, 1962. He was 68. Dr. Macdonald was born in Grand Bank, Newfoundland in 1894 and graduated from Dalhousie University in 1923. He was a dentist with the Department of Veterans Affairs and connected with the Col. Belcher Hospital in Calgary. He is survived by his wife.

MALCOLM WILLIAM MARSTON — Dr. M. W. Marston of Montreal, P. Quebec died on January 7, 1963. He was 84. Dr. Marston was born in Danville, P. Quebec in 1878. He graduated from Bishops College in 1906 and practised in Montreal.

DOSILVA MASSICOTTE — Le Dr D. Massicotte de Joliette, P. Qué., âgé de 63 ans, est décédé le 30 décembre 1962. Il était né à Ste-Mélanie, P. Qué. en 1899. Le Dr Massicotte obtint son diplôme en chirurgie dentaire à l'Université de Montréal en 1922. Il exerçait à Joliette.

JOHN FRANCIS MORRISON — Dr. J. F. Morrison of Winnipeg, Manitoba died on February 13, 1963. He was 86. Dr. Morrison was born in Waddington, New York in 1876. He studied at Northwestern University Dental College in Chicago where he graduated in 1905. He practised in both Brandon and Virden in the province of Manitoba. Dr. Morrison served as secretary of the Manitoba Dental Association from 1923 until 1956 and also as registrar from 1928 until 1956. He is survived by his wife, Bessie; a son, Wm. F. of Agincourt, Ontario; two sisters, Mrs. J. C. Phillips of Toronto, Ontario and Mrs. Leo Lewis of Winters, California; and one brother, G. F. Morrison of Winnipeg.

conventions

Western Canada Dental Society convention in Winnipeg June 9-12, 1963

The convention of the Western Canada Dental Society will be held this year at the Marlborough Hotel, Winnipeg, from June 9 to June 12. Included in the program are the following clinicians and essayists:

IRVING GLICKMAN: Practical periodontal treatment

P. G. ANDERSON: The general practitioner in the scheme of dentistry

R. H. BOOS: Clinical factors in determining maxillo-mandibular relations

W. BRASH: Use of increased rotational speeds in restorative dentistry

announcements

CONVENTIONS OF THE CANADIAN DENTAL ASSOCIATION

1963	Toronto, Ontario	May 19-22
1964	Edmonton, Alberta	June 28-July 1
1965	Quebec City, Quebec	May 30-June 2

FUTURE EVENTS

<i>Date</i>	<i>Function</i>	<i>Location</i>	<i>Officer</i>	<i>Address</i>
April 29-May 4, 1963	Dental Association of South Africa	Johannesburg, South Africa	Dr. C. J. Dreyer	P.O. Box 5247, Johannesburg, South Africa
May 12-15, 1963	British Columbia Dental Association	Harrison Hot Springs Hotel, B.C.	Dr. W. R. Upton	325-925 West Georgia Street, Vancouver, B.C.
May 18, 1963	Canadian Society of Dentistry for Children	Royal York Hotel, Toronto	Dr. D. L. Rife	3014 Bathurst Street, Toronto, Ontario
May 20-22, 1963	Canadian Society of Orthodontists	Royal York Hotel, Toronto	Dr. B. J. Levin	51 Eglinton Ave. East, Toronto, Ont.
May 20-21, 1963	Canadian Society of Oral Surgeons	Royal York Hotel, Toronto	Dr. D. H. J. MacDonald	2 College Street, Toronto, Ont.
May 21, 1963	Canadian Academy of Periodontology	Royal York Hotel, Toronto	Dr. J. E. Speck	170 St. George Street, Toronto, Ont.
23-25 mai 1963	L'Association dentaire de la province de Québec	Hôtel Reine Elisabeth, Montréal	Dr. Claude Vachon	1958 ouest Dorchester, Montréal, P.Qué.
May 24-26, 1963	Swiss Dental Society	Palais de Beaulieu, Lausanne	Dr. F. Rossel	18 rue de l'Ale, Lausanne, Switzerland
June 9-12, 1963	Western Canada Dental Society	Marlborough Hotel, Winnipeg	Dr. J. P. Beattie	435 Academy Road, Winnipeg 9, Man.
July 1-3, 1963	Atlantic Provinces Dental Convention	Fredericton, New Brunswick	Dr. K. A. Hetherington	98 York Street, Fredericton, N.B.
July 1-7, 1963	Fédération Dentaire Internationale	Stockholm, Sweden	Dr. T. Telander	Nybrogatan 53, Stockholm C, Sweden
July 22-26, 1963	British Dental Association	Oxford, England	Dr. J. N. Peacock	13 Hill Street, London W.1, England.

POSTGRADUATE AND REFRESHER COURSES (CANADA)

MONTREAL—The Faculty of Dental Surgery, Université de Montréal will present the following postgraduate courses: PERIODONTICS, May 20-22, 1963; OCCLUSION, May 28-29, 1963; and PREVENTIVE ORTHODONTICS, June 17-21, 1963.

TORONTO—The Faculty of Dentistry, University of Toronto presents a special two-day postgraduate course on OCCLUSION, May 16 and 17, 1963. Professor Ulf Posselt, director of the Department of Occlusal Analysis and Rehabilitation at the Royal Dental School, Malmö, Sweden will be the guest lecturer. The course will be under the general direction of Dr. C. H. M. Williams. Tuition fee \$60.

Applications should be directed to the chairman, Division of Postgraduate Studies, Faculty of Dentistry, University of Toronto, 124 Edward Street, Toronto 2, Ontario.

Note • Due to lack of space the Journal cannot accommodate all announcements of foreign dental meetings and postgraduate and refresher courses. Readers are invited to write to C.D.A. headquarters for information concerning unlisted meetings and courses. Further information concerning listed meetings and courses should be sought from the sponsoring institutions.

cda retirement savings plan plan d'épargne-retraite adc

Statement as of February 28, 1963 Relevé au 28 février 1963

The Canadian Dental Association Retirement Savings Plan provides dentists in Canada with a flexible method of investing savings on which they may obtain tax deferment. Three separate investment funds are available to participants, namely a Government Bond Fund, a Corporate Bond Fund and a Common Stock Fund.

GOVERNMENT BOND FUND

The Government Bond Fund is invested in Canada, provincial, and municipal bonds and mortgages guaranteed under the National Housing Act. The unit price reflects accumulated income and fluctuations in interest rates.

Market value of fund	\$270,683
Unit value of fund	\$12.088

CORPORATE BOND FUND

The Corporate Bond Fund is invested in fixed income obligations of companies incorporated in Canada, the United States or the United Kingdom and in conventional mortgages. The unit price reflects accumulated income and fluctuations in interest rates.

Market value of fund	\$470,654
Unit value of fund	\$12.799

COMMON STOCK FUND

The Common Stock Fund provides a medium for investing in equities and for participating in the long-term growth of the economy. The unit value reflects changes in the stock market prices and the general economic conditions together with accumulated income.

Market value of fund	\$1,090,399
Unit value of fund	\$15.021

Further information can be obtained from the Canadian Dental Association Retirement Savings Plan, 2249 Yonge Street, Toronto 7, Ontario or from the nearest branch of the Royal Trust Company.

tion, à savoir: un fonds d'obligations gouvernementales, un fonds d'obligations corporatives et un fonds d'actions ordinaires. Les participants peuvent varier leurs contributions entre les fonds, ou encore effectuer le transfert d'un fonds à un autre sans être sujets à l'impôt.

FONDS D'OBLIGATIONS GOUVERNEMENTALES

Le fonds d'obligations gouvernementales est investi dans des obligations et débiteures du Canada ou garanties par celui, d'une province du Canada ou d'une municipalité et d'hypothèques garanties en vertu de la Loi nationale sur l'habitation. Le prix unitaire reflète le revenu accumulé et les fluctuations des taux d'intérêt.

Valeur du fonds au marché	\$270,683
Valeur unitaire du fonds	\$12.088

FONDS D'OBLIGATIONS CORPORATIVES

Le fonds d'obligations corporatives est placé dans des obligations à revenu fixe de sociétés incorporées au Canada, aux Etats-Unis ou dans le Royaume-Uni et dans des hypothèques conventionnelles. Le prix unitaire reflète le revenu accumulé et les fluctuations des taux d'intérêt.

Valeur du fonds au marché	\$470,654
Valeur unitaire du fonds	\$12.779

FONDS D' ACTIONS ORDINAIRES

Le fonds d'actions ordinaires procure un moyen de placement sous forme d'avoir et de participation dans la croissance à long terme de l'économie. Les placements dans des sociétés canadiennes prédominent mais des investissements peuvent être faits à l'extérieur du Canada afin de profiter d'occasions particulièrement intéressantes. La valeur unitaire reflète les fluctuations des prix du marché, la situation économique générale ainsi que le revenu accumulé.

Valeur du fonds au marché	\$1,090,399
Valeur unitaire du fonds	\$15.021

Le programme d'épargne-retraite de l'Association dentaire canadienne procure aux dentistes du Canada un moyen souple de placer leurs épargnes tout en bénéficiant d'un retardement d'impôt. Trois fonds de placements distincts sont à leur disposi-

On peut obtenir d'autres renseignements en s'adressant au Plan d'épargne-retraite de l'Association dentaire canadienne, 2249 rue Yonge, Toronto 7, Ontario ou à la succursale la plus rapprochée de la Royal Trust Company.

Common stock fund as at February 28, 1963

Fonds d'actions ordinaires au 28 février 1963.

Description	Number of shares Nombre d'actions	Value Valeur
Canadian stocks • Actions ordinaires canadiennes		
Banks and Finance • Banques et finance		
Bank of Montreal	800	50,200
Bank of Nova Scotia	400	28,400
Royal Bank of Canada	550	40,013
Industrial Acceptance Corp.	1,100	28,050
Beverages • Breuvages		
Canadian Breweries	3,700	37,925
Hiram Walker Gooderham & Worts	700	38,850
Forest Products • Produits forestiers		
Dominion Tar & Chemical	1,500	26,813
Great Lakes Paper	1,000	17,250
MacMillan, Bloedel & Powell River	700	15,663
Iron and Steel • Industrie lourde et de l'acier		
Algoma Steel	800	37,200
Steel Company of Canada	2,200	40,700
Merchandising • Détaillants		
Simpsons	585	17,989
Geo. Weston, Class "B"	1,650	34,238
Metals • Métaux		
Aluminium Ltd.	1,095	25,048
International Nickel	695	44,480
Miscellaneous • Divers		
Canadian Pacific Railway	585	15,283
Moore Corporation	800	40,100
Petroleum • Pétroles		
B.A. Oil	1,000	30,000
Pipelines		
Interprovincial Pipelines	585	45,923
Trans-Canada Pipe Lines	1,000	25,625
Electric Utilities • Electricité		
Calgary Power	1,390	28,495
International Utilities	900	43,875
Shawinigan Water & Power	805	24,351
Gas distribution • Distribution de gaz		
Consumers' Gas	2,500	50,313
Telephone • Téléphone		
Bell Telephone	800	43,100
Total		829,884
Foreign stocks • Actions ordinaires étrangères		
Chemicals • Produits chimiques		
E. I. du Pont	140	35,477
W. R. Grace & Co.	600	24,318
Monsanto Chemicals	770	41,472
Aviation		
North American Aviation	510	33,992
Electrical products • Produits électriques		
General Electric	220	17,241
Insurance • Assurance		
Insurance Co. of North America	300	31,629
Miscellaneous • Divers		
I.B.M.	80	34,449
Petroleum • Pétroles		
Royal Dutch Petroleum Co.	800	39,424
Total		258,002
Total securities • Valeur totale		1,087,886
Cash • En caisse		2,513
Total value • Valeur globale		1,090,399

L'Association Dentaire Canadienne

Volume 29

Numéro 4

avril 1963

JOURNAL

The Canadian Dental Association

Les agents employés en anesthésie dentaire

par Luc Perreault, M.D., Montréal, P.Qué.

Il est agréable de constater, si on jette un regard en arrière, comment la chirurgie dentaire et l'anesthésie se rencontrent à leurs origines. En effet, l'histoire nous raconte qu'en 1844, un dentiste, nommé Horace Wells, assistant à une démonstration d'un certain Gardner Colton sur les propriétés analgésiques du protoxyde d'azote, décida d'en faire l'expérience sur lui-même. Il fut donc le premier patient à subir une extraction dentaire sous anesthésie générale, ayant comme anesthésiste le dénommé Colton, et, comme dentiste,

un confrère du nom de Riggs. L'opération fut sans douleur et Wells appliqua la technique à sa clientèle. A la fin de la même année, il se rend à Boston pour une démonstration à des étudiants du Harvard Medical School. C'est la déception de sa vie: le patient ressent une vive douleur et l'affaire tourne mal; Horace Wells est expulsé de la salle. Découragé, il abandonne son art et il erre quelque temps à travers le pays. Condamné à la prison pour une affaire de prostitution, il connaît une triste fin en se suicidant quelque temps plus tard.

Deux ans à peine se sont écoulés qu'un autre dentiste, Thomas Green Morton, un

*Conférence prononcée à la Société dentaire de Montréal, le 22 janvier 1963.

disciple de Wells, expérimentant sur les chiens, recherche les effets de l'inhalation de vapeurs d'éther par l'organisme. Impressionné par le résultat, il pratique, le 30 septembre 1846, une extraction dentaire chez un patient du nom de Eben Frost en lui faisant respirer des vapeurs d'éther. Plus fortuné que son maître, il donne avec succès une démonstration au Massachusetts General Hospital, en octobre de la même année. Cependant, malgré bien des démarches, il meurt sans obtenir le crédit de sa découverte.

Le problème de la suppression de la douleur qui a rapproché nos deux arts au siècle dernier contribue, encore de nos jours, à maintenir un contact étroit entre les dentistes et les anesthésistes. Mais les temps ont changé et les progrès fantastiques accomplis dans le domaine de l'anesthésie nous permettent de répondre plus adéquatement aux besoins actuels.

Les progrès des sciences de base: chimie, biochimie, physiologie et pharmacologie, en plus de mettre à notre disposition un arsenal beaucoup plus complet, nous permettent maintenant d'employer les substances anesthésiques avec un minimum de risques pour le patient.

A cause des circonstances spéciales dans lesquelles nous travaillons, l'anesthésie au cabinet du dentiste exige que les agents employés soient doués de propriétés particulières. La principale propriété est sans doute la non-explosivité de l'agent. En effet, la proximité de moteurs électriques, de réostats, des Rayons-X, la chaleur produite par le meulage des dents sont des risques qui pourraient changer en désastre la plus calme des anesthésies conduite avec une substance explosive.

En second lieu, l'agent doit allier à un effet suffisant une faible toxicité. La dentisterie moderne exige que l'on puisse administrer une anesthésie prolongée sans pour cela augmenter les risques du côté du patient. La substance employée doit être active à faible concentration pour permettre une oxygénation adéquate et elle doit réduire au minimum les perturbations cardiovasculaires et respiratoires.

Enfin, considérant que tous les patients

endormis dans des cabinets dentaires sont des patients ambulants, ayant très peu ou pas de prémédication, l'agent devra produire un sommeil rapide et agréable, de façon à éviter ces inductions orageuses accompagnées de luttes violentes et de délires effarants dont tout dentiste a certainement été témoin au moins une fois dans sa carrière. Et puis, le travail terminé, le malade doit s'éveiller complètement dans les quinze minutes qui suivent et la recouvrance doit se faire autant que possible sans nausée, ni vomissement.

Le but de cette communication est de jeter un rapide coup d'œil sur les principaux agents qui trouvent leur indication en anesthésie dentaire. Selon leur état physique et leur mode d'administration, on peut diviser les agents en trois catégories:

Les substances gazeuses

Les liquides volatiles

Les agents intraveineux

LES SUBSTANCES GAZEUSES

Parmi les substances gazeuses, le premier agent qui retient notre attention est le protoxyde d'azote. Depuis très longtemps, son usage a rendu et rend encore d'énormes services en anesthésie dentaire. C'est un gaz stable qui se liquéfie à la température ordinaire sous une pression de 40 atmosphères. C'est sous cette forme qu'il nous est livré dans le commerce.

Ses propriétés anesthésiques sont plutôt faibles, ce qui nous oblige à l'employer à des concentrations très élevées pour atteindre le stade chirurgical.

Ceci limite son emploi à des procédures brèves à cause du danger d'hypoxie qu'il comporte. Par contre, c'est une substance non-explosive qui procure une induction agréable et douce, sauf chez les personnes craintives qui peuvent déclencher des cauchemars durant la période d'induction. D'autre part, les patients costauds et les alcooliques qui sont plus résistants à l'anesthésie ne parviennent que très rarement au stade chirurgical sans l'addition de substances adjuvantes. Le réveil est

très rapide et, dans les quelques minutes qui suivent la fin de l'anesthésie, le patient est complètement éveillé.

Le cyclopropane est un gaz qui se liquéfie à la température ordinaire, sous une pression de 75 lbs/p.c. Chimiquement, c'est un agent très puissant qui produit une anesthésie légère à une concentration de 8%, tandis qu'une concentration de 20% suffit pour une anesthésie chirurgicale moyenne. Cette marge de 8 à 20% donne une oxygénation amplement suffisante, puisqu'à la concentration la plus élevée, le patient recevra un minimum de 80% d'oxygène.

Ses propriétés physiques font que son induction est rapide et pas trop déplaisante et le réveil se produit presque aussi rapidement qu'avec le protoxyde d'azote. Par contre, on observe souvent des nausées au réveil, et, ce qui est très important, c'est une substance hautement explosive en présence d'oxygène. A cause des autres moyens dont on dispose, son usage devrait se limiter aux patients hospitalisés où il est possible d'administrer le cyclopropane en circuit fermé, avec toutes les précautions nécessaires pour prévenir les explosions.

LES LIQUIDES VOLATILS

Les liquides volatils constituent le groupe d'anesthésiques qui nous offrent le plus grand choix. Le plus connu est certainement le chlorure d'éthyle. Agent puissant mais dangereux, son usage s'est à peu près toujours limité aux extractions chez les enfants. Son principal danger consiste à déprimer le myocarde aussi rapidement que la respiration, exposant ainsi le patient à un arrêt cardiaque dès le début de l'anesthésie. Aussi ne doit-on l'employer qu'à doses analgésiques, en surveillant attentivement le niveau de l'anesthésie, car on peut atteindre une anesthésie chirurgicale profonde en l'espace de quelques secondes.

Le Trilène, ce liquide bleu qui s'emploie couramment de nos jours, associé au protoxyde d'azote, est un excellent

agent. Sa puissance anesthésique est relativement faible, mais il possède un pouvoir analgésique appréciable, ce qui rend son association avec le protoxyde d'azote des plus heureuses. L'induction est agréable, assez calme, et sa toxicité est faible. Le réveil est rapide et c'est un agent non explosif. Ses seuls inconvénients consistent à ne pas donner de relâchement musculaire et à produire des arythmies cardiaques.

Depuis quelques années, l'anesthésie s'est enrichie d'un nouvel agent: c'est l'Halothane ou Fluothane. Son avènement dans le cabinet du chirurgien-dentiste s'avère de plus en plus une amélioration sur les techniques employées antérieurement. Alors qu'avec la plupart des agents précédents, le chirurgien doit se limiter à des procédures aussi brèves que possible, il peut maintenant envisager des interventions beaucoup plus longues sans craindre le réveil trop hâtif du patient ou l'hypoxie prolongée que causent de trop fortes concentrations de protoxyde d'azote. C'est un agent puissant et non explosif. L'induction est conduite assez rapidement avec le mélange N° 0/02 en proportions égales auquel on ajoute des concentrations croissantes de Fluothane. La maintenance se fait avec Protoxyde-Fluothane - O₂. Le débit total varie entre 8 à 10 l/min. et quelquefois davantage, surtout au cours des procédures prolongées où l'on s'efforce de donner un débit / minute supérieur au volume / minute du patient, de façon à prévenir au maximum la réinspiration qui favoriserait une accumulation de CO₂ et qui modifierait les concentrations de Fluothane dans l'atmosphère inspirée.

La position centrée des globes oculaires, le degré de dilatation pupillaire, la vitesse du pouls et l'absence de signes témoignant d'une réaction à la douleur sont les principaux critères sur lesquels on se base pour juger de la profondeur de l'anesthésie. En aucun temps, on tolère une mydriase fixe que l'on considère comme une anesthésie trop profonde.

Les avantages de cette technique sont nombreux. Pour le patient, l'induction est

agréable, tant pour l'adulte que pour l'enfant. Le réveil est rapide et, après quelques minutes, l'élimination est à peu près complète, de sorte que le patient se sent très bien. L'absence de nausée et de vomissement est remarquable, tant dans la période de réveil que dans les heures qui suivent l'anesthésie. Aussi, 95% des sujets peuvent s'alimenter environ deux heures après la fin de l'anesthésie. L'absence d'hypoxie au cours de l'anesthésie contribue pour beaucoup à la sécurité de la technique et au bien-être du patient au réveil.

Du côté de l'opérateur, les avantages ne sont pas moindres. Les cauchemars et l'agitation de la période d'induction, si souvent observés avec le protoxyde d'azote sont absents avec le Fluothane. La puissance du Fluothane permet d'obtenir un plan d'anesthésie suffisant pour éliminer la réponse aux stimuli douloureux et, par conséquent, procure une tranquillité absolue pour l'opérateur.

En même temps, le relâchement du maxillaire et du pharynx est complet et permet de placer avec facilité l'ouvre-bouche et le tampon pharyngé. L'absence de salive et la sécheresse complète des muqueuses sont un autre avantage très important qui procure des conditions idéales pour les obturations. Enfin, le Fluothane a comme dernier avantage d'être l'un des rares anesthésiques à allier en même temps la puissance et la non-explosivité.

Comme désavantage, il faut noter le danger de surdosage. Le produit a le défaut de sa principale qualité: en effet, sa puissance est telle que le dosage doit être constamment surveillé et les signes d'anesthésie, notés avec soin.

Un autre liquide volatil a fait son apparition en clinique, il y a quelques mois. Il s'agit du Penthrane. C'est un éther halogéné qui possède une puissance analgésique très élevée, mais vu la lenteur relative de son induction et de son réveil, il n'a pas encore trouvé sa place en anesthésie dentaire, du moins chez les malades ambulants.

LES AGENTS INTRA-VEINEUX

La troisième catégorie d'anesthésiques consistent en substances qui s'administrent par voie intra-veineuse. Ici, on retrouve à peu près uniquement les barbituriques à action ultra-brève, i.e. le pentothal, le surital et le brévitall. Ce sont des agents à action rapide, mais aussi très brève. Comme tous les barbituriques, leur pouvoir analgésique est très faible et ils permettent des interventions douloureuses par leur seule puissance hypnotique. Leur induction est tellement agréable que beaucoup de patients demandent à se faire anesthésier de cette façon, mais au réveil, le sujet demeure somnolent durant une période plus prolongée et il ressent souvent les symptômes du "Hang over." Il reste que ce sont de très bonnes substances qui peuvent être employées seules ou associées au protoxyde d'azote ou au mélange protoxyde-Fluothane-O₂.

On peut donc conclure que l'anesthésie moderne possède les moyens nécessaires pour procurer aux patients un sommeil agréable, tout en maintenant au minimum les risques qui l'accompagnent. De nos jours, se faire endormir pour extraction dentaire ou pour des obturations est devenu une pratique courante et connue du public. Et l'on peut prévoir que la chose sera encore plus facile dans l'avenir. Il faudra donc nous préparer en conséquence. Et si les dentistes doivent se faire à l'idée d'interventions de plus en plus fréquentes sous anesthésie générale, les anesthésistes, de leur côté, travaillent à rendre possibles des interventions de plus en plus prolongées avec le minimum d'inconvénients pour le patient. Avec la connaissance de plus en plus approfondie de la physiologie et l'avènement fréquent de nouvelles substances anesthésiques, l'avenir, dans ce domaine, est très prometteur.

SUMMARY

The author, after having stated the requirements of the ideal agent for general

dental anaesthesia, reviews the different anaesthetics used nowadays in the dental office: nitrous oxide, cyclopropane, ethyl chloride, trichloroethylene (Trilene), halothane (Fluothane), methoxyflurane (Penthrane), sodium thiopental (Pentothal),

sodium thiamylal (Surital) and sodium methohexital (Brietal, Brevital).

The advantages and disadvantages of each agent are discussed, special reference being made to halothane.

2407 Victor Doré

L'interprétation du diagnostic en endodontie: 2

par Gérard Lussier,* D.D.S., St-Lambert, P. Qué.

Nous distinguons six maladies de la pulpe et cinq maladies des tissus périapicaux:

Maladies de la pulpe. — (1) hyperémie, (2) pulpite aigüe séreuse, (3) pulpite aigüe purulente, (4) pulpite chronique ulcéreuse, (5) pulpite hyperplasique ou hypertrophique, (6) nécrose ou gangrène pulpaire.

Maladies des tissus périapicaux. — (1) périodontite apicale aigüe, (2) abcès alvéolaire aigu, (3) abcès alvéolaire chronique, (4) granulôme, (5) kyste radiculaire.

Les tests les plus employés pour diagnostiquer ces deux groupes de maladies sont: (1) l'interprétation des signes douloureux (genre, durée, etc.), (2) l'examen radiologique, (3) le test électrique, (4) le test thermique (chaleur, froid, sucres, acides), (5) la percussion et la palpation (mobilité de la dent, son allongement, etc.).

LES MALADIES DE LA PULPE

Hypérémie.—Un patient se présente souvent chez le dentiste à cause d'une douleur subite qu'il ressent dans une de ses dents, et cela, chaque fois qu'il absorbe un liquide ou un aliment froid. Il s'empresse d'inquer la dent responsable de ce malaise en insistant que la douleur qu'il ressent est de courte durée (question de secondes).

Il s'agit d'une hyperémie, si le test électrique, avec le même degré de courant, cause plus de douleur dans cette dent que dans la voisine et si la radiographie montre une carie pénétrant la dentine. Ces signes suffisent pour poser le diagnostic.

L'hypérémie est comme un signal de détresse que lance la pulpe en indiquant que sa résistance normale est poussée à son extrême limite.

Que se produit-il alors? Il y a une accumulation excessive de sang dans la pulpe, résultat d'une congestion vasculaire. Le phénomène inflammatoire chasse un peu de liquide interstitiel en dehors de la pulpe pour faire place à l'arrivée d'une plus grande quantité de sang.

Cette affection ne commande pas nécessairement l'extirpation de la pulpe.

Suite de la communication publiée dans la livraison de février 1963 du *Journal de l'Association dentaire canadienne*.

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Il suffit d'éliminer la cause de l'irritation et tout entre dans l'ordre.

Ces causes d'irritation peuvent être bactériennes, thermiques, traumatiques, chimiques, galvaniques.

Pulpite aiguë séreuse.—Une complication de l'hypérémie est la pulpite. Si le patient retarde le traitement, sa douleur devient aiguë, localisée à un endroit précis, spontanée, surgissant à tout hasard, sans provocation, et dure quelques minutes. La dent réagit violemment à la vitalométrie, même très faible, et la douleur s'accroît vivement au contact de la dent avec le froid. Le dentiste, face à ces symptômes, peut conclure, sans examen radiologique, qu'il s'agit d'une pulpite aiguë séreuse.

Les symptômes, dans ces cas, s'apparentent à ceux de l'hypérémie, mais ils sont accentués et plus prolongés. Les causes en sont les mêmes.

On sait que la pulpe, au point de vue histologique, contient tous les éléments cellulaires nécessaires à l'édification d'une zone inflammatoire défensive indispensable pour arrêter ou retarder l'invasion des tubuli dentinaires par les agents irritants.

La pulpite aiguë séreuse présente les signes caractéristiques de l'inflammation; les leucocytes sont accumulés autour des vaisseaux sanguins et les odontoblastes du voisinage de la région affectée sont très souvent détruits.

Le traitement indiqué consiste dans une biopulpectomie.

Pulpite aiguë purulente. — La douleur éprouvée peut être continue, épuisante, plus intense en fin de journée. Le test thermique occasionne une augmentation de la douleur à la chaleur et une diminution au froid. La radiographie illustre une carie profonde longeant la paroi pulpaire. Il n'en faut pas plus pour déceler une pulpite aiguë purulente.

La cause la plus commune d'une pulpite aiguë purulente est une carie profonde s'étendant à proximité de la pulpe, provoquant une inflammation aiguë avec formation d'abcès.

L'exudat provenant de l'abcès pulpaire (causé par les microorganismes de la lésion cariée) ne peut s'échapper, si la pulpe est encore recouverte par la carie dentinaire. Voici la cause de la douleur terrible et persistante dont souffre le malade.

Au contraire, le patient éprouve un soulagement, parfois même d'une façon complète, si la carie a exposé la pulpe. Seule la pression des aliments, au cours de la mastication, lui rappelle que tout n'est pas normal dans cette dent.

Pulpite chronique ulcéreuse.—La dent ne répond au test vitalométrique qu'à une augmentation considérable de l'influx électrique. La radiographie montre une pulpe largement exposée.

Ces signes suffisent à indiquer une pulpite chronique ulcéreuse. Une pulpite aiguë purulente, qui n'est pas éliminée par une pulpectomie, peut dégénérer à l'état chronique avec formation d'un ulcère à la surface de la pulpe dans la région d'une exposition. La résistance constitutionnelle du patient devient un facteur important. Cet ulcère, d'une façon générale, ne fait pas corps avec la pulpe; il est emmuré par une barrière de petites cellules rondes qui limitent son étendue.

D'autre part, l'évolution inflammatoire de la pulpe peut s'étendre et comprendre tout le canal radiculaire. C'est pourquoi, la radiographie ne montre qu'une vaste exposition de pulpe, sans réaction à l'apex de la dent.

Ce phénomène s'explique par la présence de leucocytes polymorphonucléaires qui forment une barrière efficace.

Pulpite hyperplasique ou hypertrophique. — L'examen dentaire de l'adolescent révèle parfois sur des premières molaires permanentes une destruction considérable de la couronne par la carie et, au fond de la cavité, la présence d'une masse arrondie de tissu mou, rouge clair.

Cette boule ressemble à du tissu gingival qui aurait migré dans l'échancrure

coronaire. Il s'agit plutôt d'une prolifération du tissu pulpaire de la dent cariée. Le diagnostic s'établit facilement à l'examen clinique: cette lésion se nomme pulpite hyperplasique ou hypertrophique.

C'est tout simplement l'inflammation tumorale d'une pulpe exposée caractérisée par l'élaboration du tissu de granulation recouvert d'épithélium causée par une légère irritation de longue durée.

Le patient ne ressent aucune douleur, si ce n'est à la pression et la mastication; une réaction à la chaleur et au froid est possible par le contact direct avec la couche de tissu épithélial qui s'est formé à la surface. Une portion de la pulpe reste vivante; celle-ci réagit au test vitalométrique, mais à une quantité assez élevée de courant électrique. Une pulpectomie s'impose, dans ce cas, mais elle n'est pas urgente.

Nécrose ou gangrène pulpaire.—Un patient peut se rendre compte qu'une de ses dents a perdu son éclat et que sa couleur contraste avec celle des autres. Aucune douleur. Tous les tests sont négatifs. La radiographie montre peut-être un épaississement de la membrane périodontaire. Il s'agit d'une dent dont la pulpe est dévitalisée, plus précisément d'une nécrose ou gangrène pulpaire.

Si la radiographie est prise peu de temps après la dévitalisation de la pulpe, elle indique un épaississement de la membrane périodontaire: il y a eu formation de tissu de granulation autour du foramen apical juste avant la mort de la pulpe.

Si la radiographie est prise longtemps après, elle peut montrer une raréfaction apicale assez considérable.

Une nécrose pulpaire veut dire la mort d'une pulpe sans infection bactérienne, tandis que la gangrène pulpaire est une décomposition organique de la pulpe par une infection bactérienne.

Ces deux maladies de la pulpe se traitent par la pulpectomie, en prenant grand soin de ne pas pousser des débris de pulpe vers l'apex de la dent pour prévenir des complications apicales.

MALADIES DES TISSUS PÉRIAPICAUX

Périodontite apicale aigüe.—Le symptôme subjectif le plus important de cette maladie périapicale est la douleur passagère, mais très vive durant quelques instants, qui se fait sentir à la pression sur la dent avec le doigt ou au cours de la mastication.

Les deux épreuves les plus significatives sont le test électrique et le test thermique: si, à ces deux tests, la dent réagit normalement, il s'agit d'une périodontite apicale aigüe sur dent vivante. Si, au contraire, la réponse à ces deux tests est négative, il s'agit d'une périodontite apicale aigüe sur une dent sans vie.

Plusieurs facteurs sont responsables de cette maladie dentaire:

1. le facteur bactérien.—L'étendue de l'infection du canal force les bactéries de la chambre pulpaire à envahir le tissu apical, en passant par le foramen apical.

2. le facteur traumatique.—(a) nourriture logée entre les dents, (b) obturation en suroclusion, (c) lime ou pointe de papier ayant dépassé l'apex, (d) pointe d'argent dépassant l'apex d'une dent.

3. le facteur chimique.—(a) Produits toxiques des protéines de la pulpe en décomposition, poussés vers le foramen apical, (b) scellement de médicaments avec pression vers le foramen apical, (c) emploi de médicaments irritants dans les canaux radiculaires.

Une périodontite apicale aigüe montre, à la radiographie, un épaississement de la membrane périodontaire. Le test de la percussion provoque une douleur; la dent est très mobile. La palpation de la gencive au niveau de la région apicale décèle un gonflement des tissus.

Le traitement indiqué consiste à supprimer les causes.

Abcès alvéolaire aigu.—La caractéristique la plus marquante de cette affection est l'enflure; cette enflure s'accompagne de douleur constante et épuisante: la dent malade ne peut supporter aucune pression; l'application de froid seule soulage quelque peu la douleur.

Quel est le phénomène pathologique responsable de cet état? Les protéines toxiques ou les bactéries en pleine activité de la pulpe nécrosée ou gangréneuse ont passé par le foramen apical dans les tissus périapicaux, où, grâce aux leucocytes polymorphonucléaires, il s'est formé une zone inflammatoire de défense.

Abcès alvéolaire chronique. — L'examen des replis muqueux permet parfois la découverte d'une fistule dans la gencive. Une radiographie s'impose, car tous les autres tests sont négatifs. La radiographie révèle une zone de raréfaction diffuse, qui est le résultat d'un abcès alvéolaire aigu.

Le pus s'achemine au travers l'os alvéolaire, perfore la muqueuse labiale ou linguale et forme une fistule. Une inflammation chronique à l'apex d'une dent peut persister indéfiniment avec des périodes intermittentes de drainage par la fistule.

Granulôme. — Un granulôme à l'apex d'une dent se découvre généralement, à la grande surprise du patient et de l'opérateur, au cours d'un examen radiologique de routine. Cette maladie parfois n'est précédée d'aucun signe avant-coureur.

Il s'inscrit sur un film comme une zone de raréfaction circonscrite sans liséré dense à son pourtour.

Le granulôme est un exudat inflammatoire formé de cellules défensives ayant des propriétés antibactériennes et antitoxiques. Le docteur Ross déclare que "la formation du granulôme s'établit par l'arrivée constante de substances toxiques dans les tissus périapicaux provenant des bactéries en évolution dans la pulpe." L'auteur conclut que le granulôme est strictement composé de cellules de résistance: c'est une zone où les bactéries ne peuvent pas croître, elles y sont détruites.¹

Kyste radiculaire. — Le kyste, comme le granulôme, se découvre souvent au hasard d'un examen radiologique. Il est parfois sans symptôme. L'image radiologique d'un kyste diffère de celle du granulôme par son homogénéité, ses limites bien circon-

crites et une ligne nette de condensation osseuse à sa périphérie.

Le kyste radiculaire est un sac qui se forme à l'apex d'une dent et qui est constitué d'une membrane d'origine épithéliale. Le sac renferme des cellules liquéfiées.

SUMMARY

Pathological conditions affecting the pulp and the periapical tissues are classified into eleven entities for diagnostic purposes — six with respect to the pulp (hyperaemia, acute serous pulpitis, acute suppurative pulpitis, chronic ulcerative pulpitis, chronic hypertrophic pulpitis and necrosis or gangrene of the pulp), and five with respect to the periapical tissues (acute apical periodontitis, acute alveolar abscess, chronic alveolar abscess, granuloma and cysts).

Clinical diagnostic signs, symptoms and tests include: pain and its duration, radiographic examination, electric vitality tests, thermal tests, and mobility, percussion and palpation.

Pain, and the duration of pain, are important factors in hyperaemia, acute serous pulpitis, acute suppurative pulpitis and acute alveolar abscess. In the latter two instances the pain is severe and continuous. In hyperaemia the pain is usually transitory, lasting for a matter of seconds or a minute at a time, and then only following appropriate stimulation. In acute pulpitis, on the other hand, the pain may last for several minutes or longer and occurs without prior stimulation.

Radiographic examination contributes relatively little to diagnosis of diseases of the dental pulp except for disclosure of an interproximal cavity, carious involvement, or widening of the space normally occupied by the periodontal membrane in cases of necrosis of the pulp.

Electric vitality tests are desirable in all conditions affecting the pulp as well as in acute apical periodontitis affecting a live tooth. Thermal tests are helpful in the diagnosis of hyperaemia, acute serous pulpitis, acute suppurative pulpitis and acute

alveolar abscess. A positive response to heat and a negative response to cold is elicited in hyperaemia and acute serous pulpitis. A sharp response to heat and a moderate response to cold accompany acute suppurative pulpitis and acute alveolar abscess.

Mobility, percussion and palpation are important tests in connection with acute

apical periodontitis and acute alveolar abscess, and sometimes in connection with acute suppurative pulpitis.

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résumés

UNE ÉVALUATION DE L'HYDROCHLORATE DE MÉPIVACAINE

F. S. Sadove, D. Vernino, F. Lock et
S. Kolodny. *J. Oral Surg., Anesth.
and Hosp. D. Serv.* 20:399, 1962.

Des recherches entreprises, il y a quelque temps, pour comparer l'HC1 de mépivacaine à 2 pour cent (Carbocaine HC1) et l'HC1 de lidocaine à 2 pour cent (Xylocaine HC1) additionné d'un vaso-constricteur, ont montré que la mépivacaine sans vaso-constricteur était un meilleur anesthésique local, d'induction rapide, de perméabilisation convenable et d'action profonde. Les expériences actuelles ont ensuite été réalisées sur environ 700 patients pour déterminer les limites exactes d'agissement de ce nouvel anesthésique local en chirurgie dentaire, avec et sans vaso-constricteur. On s'est servi, pour cette évaluation, d'une technique à l'aveugle rigide-ment contrôlée. On a encore utilisé, pour la comparaison, de l'HC1 de lidocaine à cause de ses excellentes propriétés anesthésiques locales et à cause du bon accueil que lui ménage la profession dentaire.

La durée de l'anesthésie créée par l'HC1 de mépivacaine à 2 pour cent avec un vaso-constricteur s'est révélée plus longue que celle créée par l'HC1 de lidocaine à 2 pour cent. La différence était nettement significative au point de vue statistique.

L'addition d'un vaso-constricteur aux deux solutions anesthésiques (la levo-nordefrin 1:20,000 à la mépivacaine — l'adrénaline 1:100,000 à la lidocaine) a légèrement raccourci le temps d'induction et augmenté la durée de l'anesthésie créée par les deux solutions.

L'HC1 de mépivacaine à 2 pour cent, sans vaso-constricteur, est évidemment plus effectif pour produire une bonne anesthésie d'une plus longue durée que l'HC1 de lidocaine à 2 pour cent sans vaso-constricteur.

L'HC1 de mépivacaine à 2 pour cent avec le levo-nordefrin 1:20,000 ne donne cependant pas une anesthésie de plus longue durée que celle donnée par l'HC1 de lidocaine à 2 pour cent avec l'adrénaline 1:100,000. Il n'y a pratiquement pas de différence entre les deux solutions au sujet de l'anesthésie elle-même, excepté durant les séances de dentisterie opératoire, où l'HC1 de mépivacaine à 2 pour cent avec levo-nordefrin 1:20,000 est plus effective.

Fonds pour l'enseignement dentaire

L'éducation est un sujet d'actualité. Par tout, en Amérique, il se fait un effort gigantesque pour instruire la population. Toutes les catégories sociales s'intéressent à la question: on parle d'éducation des adultes; on facilite aux jeunes gens et aux jeunes filles l'accès aux études supérieures; on révolutionne les programmes et les méthodes d'enseignement; on invite les familles, grâce à des octrois, des bourses et des subventions à faire instruire les enfants dès l'âge le plus tendre. Il y a en Amérique ce que quelqu'un a appelé: une explosion pour la connaissance! Quelle place tient la formation des nouveaux dentistes dans ce renouveau, dans cet intérêt pour l'instruction?

Les étudiants contemporains en chirurgie dentaire bénéficient d'une aide pécuniaire que n'ont pas connue leurs prédécesseurs. Les gouvernement fédéral et provincial contribuent largement à la diffusion des connaissances humaines par des octrois statutaires et spéciaux: Conseil des arts, subventions aux universités, bourses d'étude du Ministère d'aide à la jeunesse, etc, etc. Des organismes privés, comme la Société St-Jean-Baptiste avec son Prêt d'Honneur, la Fondation Kellogg, le Collège des chirurgiens-dentistes et autres mettent à la disposition des élèves des facultés dentaires des prêts à des conditions avantageuses.

On a aussi voulu imprimer un élan à la formation des professeurs qui par des études poussées et des recherches amélioreraient aussi la qualité de l'enseignement prodigué dans les universités. Dans ce but,

on a institué, en 1958, aux Etats-Unis un organisme qui s'appelle le Fund for Dental Education. Ce fonds est alimenté par des manufacturiers et des distributeurs de marchandises dentaires, des laboratoires dentaires, des groupements de dentistes (associations et sociétés), des dentistes et enfin le grand public. Les objectifs de cet organisme sont (1) de percevoir des argents ou des valeurs négociables de toutes sortes afin d'aider ou d'améliorer directement ou indirectement l'enseignement dentaire grâce à des projets destinés à améliorer la santé dentaire par l'enseignement et la recherche, en collaboration avec les facultés dentaires et leurs étudiants; (2) aider à la croissance et aux progrès de l'enseignement dentaire en étudiant les problèmes qui s'y rapportent; (3) donner des octrois dans le but d'aider à augmenter la valeur du personnel enseignant; (4) aider par des prêts sans intérêt des étudiants méritoires, quand la chose est nécessaire. L'Association dentaire canadienne vient de créer un fonds semblable, au Canada, pour permettre aux compagnies américaines qui ont des filiales au pays de contribuer à ce fonds tout en pouvant ainsi déduire leurs dons de leur impôt canadien sur leurs revenus. Les sociétés dentaires, les dentistes, en un mot, tous ceux qui ont intérêt à voir grandir la profession dentaire en nombre et en qualité pourront verser des subventions dans ce fonds.

Notre association nationale et des firmes dentaires ont souscrit jusqu'ici \$15,000. pour lancer cette organisation, qui sera

régie par une charte de fiducie. La première assemblée du Conseil de direction de cet organisme a eu lieu à la fin de l'année 1962 et cette réunion a donné naissance à un mouvement dont on entendra

parler et qui aidera grandement la profession dentaire à atteindre une plus grande importance dans la vie de la nation canadienne.

G. de M.

les actualités dentaires

Le Canada

AUGMENTATION DES REVENUS DES DENTISTES

La profession dentaire, de 1958 à 1960, s'est classée au quatrième rang de tous les contribuables pour la moyenne des revenus gagnés. La livraison la plus récente du rapport, *statistique fiscale*, publié par le Ministère du revenu national, révèle que la moyenne des revenus des dentistes qui paient de l'impôt fut de \$12,238, en 1960, ce qui représente une augmentation de 5% sur les chiffres de 1959. Vingt-neuf pour cent de tous les dentistes se groupaient dans l'échelon de \$10,000.-\$15,000. et dix-sept pour cent dans celui de \$15,000.-\$20,000.

La moyenne des revenus provenant de l'exercice professionnel fut \$11,509. Les revenus nets, après déduction d'impôt, fut de \$9,857. Une moyenne de \$2,381., ou près de

vingt pour cent du revenu total après déduction des dépenses, fut consacrée à l'impôt.

Les personnes qui gagnent \$10,000. et plus représentent trois per cent de tous les contribuables canadiens. Ce trois pour cent gagne 13 pour cent de tous les revenus et paient 31 pour cent de l'impôt total.

Le rapport mentionne que "puisque tous les citoyens n'ont pas des revenus suffisants pour payer de l'impôt... la *Statistique fiscale* ne couvre pas toutes les personnes de chacune des régions du pays et de toutes les occupations". En 1960, au moins 201 dentistes n'ont pas eu des revenus suffisants pour qu'ils paient des impôts. Quarante de ceux-ci avaient 65 ans et plus. Le nombre de personnes mentionnées comme faisant partie d'un groupe professionnel, tel. que la chirurgie dentaire, est, de ce fait, moindre que celui paraissant dans les bottins professionnels." C'est parce que les statistiques d'impôt touchant ces groupements professionnels comprennent seulement les personnes dont la principale source de revenus

TABLEAU Revenu moyen avant et après déduction de l'impôt des contribuables canadiens classés selon leur occupation, 1962, et impôt moyen en pourcentage du revenu moyen.

Occupation	Moyenne de revenus		Moyenne d'impôt comme pourcentage de la moyenne des revenus
	avant l'impôt	après l'impôt	
Médecins et chirurgiens	\$16,323	\$12,610	22.7
Ingénieurs et architectes	15,670	11,825	24.5
Avocats et notaires	14,597	11,097	24.0
Dentistes	12,238	9,857	19.5
Comptables	11,446	9,164	19.9
Autres professionnels	5,683	4,916	13.5
Autres	4,153	3,769	9.2
Total	4,232	3,826	9.6

provient de l'exercice de leur profession." Un dentiste, dont la principale source de revenus est un salaire, est classé comme un employé.

Les sociétés dentaires

SOCIÉTÉ DE STOMATOLOGIE DE QUÉBEC

La Société de stomatologie de Québec, au cours de ses assemblées mensuelles de décembre 1962 et de janvier 1963, a quelque peu modifié sa formule habituelle en invitant à se joindre à ses membres d'abord les techniciens de la ville et des environs et ensuite les assistantes dentaires.

Le conférencier invité de décembre était le docteur Francis Morse, de New York, qui traita de la préparation des piles pour divers genres de couronnes en porcelaine et de leur confection.

L'invité du mois de janvier était le docteur Roger Grégoire, de Montréal, qui exposa les fonctions d'une assistante dans un cabinet dentaire.

Le Corps dentaire royal canadien

HONNEUR ACCORDÉ AU COLONEL MERRITT

Sa Majesté la reine Elizabeth II a gracieusement approuvé la nomination du colonel John Eugene Merritt, E.D., D.D.S., au poste de chirurgien dentiste honoraire de la Reine.

Le colonel Merritt, qui est directeur adjoint des Services dentaires (Milice) et membre du personnel consultatif aux affaires dentaires dans le Secteur de l'Est, est né dans le comté de Kings, au Nouveau-Brunswick, et il a reçu son diplôme de l'Université de Toronto, en 1943. Il obtient son brevet d'officier au grade de lieutenant en mars 1943; promu capitaine en mars 1944, il se rend outre-mer en janvier 1945 et sert en Grande-Bretagne de même que dans le Nord-Ouest de l'Europe. De retour au Canada

en 1946, il demande sa libération pour entrer dans la Réserve.

En juillet 1948, il passe avec le grade de capitaine de la Réserve supplémentaire à la 5^e Compagnie dentaire de la Réserve stationnée à Halifax (N.-E.). Le 1^{er} novembre 1949, il est promu major et on lui confie le poste de commandant en second de cette même compagnie. En novembre 1952, il est promu lieutenant-colonel et nommé commandant de la 5^e Compagnie dentaire (appelée plus tard 50^e Unité dentaire), à Halifax. Il en garde le commandement jusqu'en décembre 1955, alors qu'il est nommé membre du personnel consultatif aux affaires dentaires en qualité de sous-directeur adjoint des Services dentaires dans le Secteur du Nouveau-Brunswick (Région de l'Est).

Le 1^{er} mai 1959, on lui confie le poste qu'il occupe actuellement et on lui accorde le grade de colonel.

NOUVEL OFFICIER DENTISTE

Le capitaine Albert G. MacKenzie, qui a obtenu son diplôme de l'Université Dalhousie en 1953, s'est enrôlé dans le Corps dentaire après avoir exercé sa profession à North-Sydney (N.-E.). Il est présentement stationné à Halifax.

RENCONTRE DES OFFICIERS DE LA MILICE ET DE L'ASSOCIATION DU CORPS DENTAIRE À CAMP BORDEN

La réunion annuelle de l'Association du Corps dentaire a eu lieu à l'École du Corps dentaire à Camp Borden au cours de la première fin de semaine d'octobre. Plusieurs des délégués de la Milice du Corps dentaire venaient justement de terminer un cours portant sur la survie nationale en prévision de l'examen de promotion au grade de major. Voici le nom des officiers qui ont assisté à la réunion de l'exécutif de l'Association du Corps dentaire: Colonel J. F. Edgecombe, Saint-Jean (N.-B.); commandant du Corps dentaire; Brigadier E. M. Wansbrough, Ottawa; Colonel C. B. H. Climo, Ottawa; Lieut.-col. W. G. Campbell, Winnipeg; Lieut.-col. G. L. Ramsay, Saint-Jean (N.-B.); Lieut.-col. C. E. Woods, Ottawa; et Lieut.-col. N. L. Simon, Hamilton;

Les officiers suivants ont été nommés membres de l'exécutif pour 1962-1963: prési-

dents honoraires; Colonel L. E. Kent, Montréal et Colonel W. E. Meldrum, Ottawa; président-sortant-de charge: Lieut.-col. J. S. Goodfellow, Calgary; président: Lieut.-col. W. G. Campbell, Winnipeg; président-élu: Lieut.-col. G. L. Ramsay, Saint-Jean (N.-B.); 1^{er} vice-président: Lieut.-col. A. Z. Henry, Toronto; 2^e vice-président: Lieut.-col. N. L. Simon, Hamilton; secrétaire: Colonel C. B. H. Climo, Ottawa; et trésorier: Lieut.-col. C. E. Woods, Ottawa.

Un des principaux événements de la semaine a été le dîner de mess qui a eu lieu, jeudi le 4 octobre et au cours duquel on a présenté les trophées du concours de compétence générale organisé par la Milice pour la présente année. Le brigadier K. M. Baird, directeur général des Services dentaires pour les forces armées du Canada, qui a procédé à la remise des trophées, a tenu à féliciter toutes les unités qui ont pris part au concours pour les beaux résultats obtenus.

LE LT-COL. COVEY SUIVIT UN COURS SPÉCIAL AU COLLÈGE DE LA DÉFENSE NATIONALE

Le lt-col. G. R. Covey, qui fait partie du personnel de la Direction des services dentaires, a été le seul dentiste à suivre le cours d'opérations et d'administration (Santé) donné par les Services de santé d'urgence au Collège de la défense civile d'Arnprior, du 10 au 14 décembre dernier. Ce cours était destiné au personnel médical civil affecté au quartier général d'une région, d'un secteur, d'une municipalité ou d'une zone-cible, et il portait sur les mesures courantes et probables à instituer à tous les paliers au cas de catastrophe nationale.

AFFECTATIONS AU CANADA

Les nominations suivantes ont été faites récemment parmi les officiers dentistes au Canada:

Le major I. A. C. MacDonald, qui était à Calgary (Alb.), a été affecté au Réseau routier du Nord-Ouest.

Le major S. W. Muller, qui était à Whitehorse, a été affecté au H.M.C.S. Naden, à Esquimalt (C.-B.).

Le capitaine M. A. Abramson, qui était au H.M.C.S. Shearwater, a été affecté à l'arsenal maritime d'Halifax (N.-E.).

Le capitaine E. W. Gazo, qui se trouvait à la base de l'A.R.C. à Trenton, a été affecté à Camp Picton (Ont.).

Le capitaine W. T. H. Harley, qui était au H.M.C.S. Naden, a été affecté à la garnison de Calgary (Alb.).

Le capitaine L. A. Reynolds, qui se trouvait à la base de l'A.R.C. à Clinton, a été affecté à la base de l'A.R.C. de North-Bay (Ont.).

Le capitaine H. C. Stewart, qui était à la base de l'A.R.C. de Saskatoon, a été affecté aux casernes de Fort Osborne, à Winnipeg (Man.).

Le capitaine D. A. Warrick, qui se trouvait à Camp Ipperwash, a été affecté au 7^e Dépôt du personnel, à London (Ont.).

LE MAJOR C. BROWN REVIENT D'EUROPE

Le major C. Brown a été affecté au quartier général de Secteur militaire du Manitoba, à Winnipeg, à son retour du stage qu'il a fait avec la 4^e Compagnie dentaire de campagne en Allemagne.

AFFECTATION D'UN NOUVEL OFFICIER

Le capitaine J.-M.-L. Rochefort, diplômé de l'Université de Montréal, commence sa carrière dans le Corps dentaire au Centre interarmes d'entraînement aérien de Rivers (Man.).

CRÉATION DES TROPHÉES "EDGECOMBE AWARD" ET "HUGH McLAREN MEMORIAL"

L'Association du Corps dentaire vient d'annoncer que le colonel J. F. Edgecombe, commandant du Corps dentaire, a remis une somme d'argent pour la création du trophée "Edgecombe Award", qui sera offert chaque année à l'unité de la Milice qui aura fait le plus pour promouvoir le travail de l'Association au cours de l'année.

On a également annoncé l'achat d'un marteau approprié portant gravée une inscription et devant servir à toutes les réunions qui auront lieu, en vue de commémorer la mémoire du regretté colonel Hugh R. McLaren qui, en plus de s'être occupé activement de la Milice du Corps dentaire pendant longtemps, a rempli le rôle de trésorier de l'Association du Corps dentaire durant de nombreuses années.

DON D'UN TROPHÉE PAR UN ANCIEN DIRECTEUR

Le brigadier E. M. Wansbrough, O.B.E., M.M., E.D., C.D., directeur général des Services dentaires de 1946 à 1958, vient de donner un très beau trophée de curling pour le concours annuel qui a lieu entre les équipes formées de militaires de l'Armée régulière et de la Milice. Le nom des vainqueurs sera gravé sur ce trophée, qui restera à l'Ecole du Corps dentaire. Le premier tournoi annuel pour ce trophée aura lieu à Camp Borden le 9 mars prochain et on espère que des équipes venant des différentes parties du Canada y prendront part.

CLUB TOASTMASTER À L'ÉCOLE DU CORPS DENTAIRE

En vue de permettre aux étudiants et au personnel de l'Ecole du Corps dentaire, à Camp Borden, de se familiariser davantage avec l'art oratoire, un chapitre du club Toastmaster y tient une réunion chaque jour pendant l'heure du dîner. Cette initiative a soulevé jusqu'à présent un véritable enthousiasme et les progrès réalisés sont excellents.

APPLICATION DE FLUORURE D'ÉTAIN

Le Corps dentaire vient d'entreprendre l'application d'une solution de 8 pour cent de fluorure d'étain à toutes les recrues et à tous les élèves-officiers des forces armées canadiennes. On est d'avis que l'efficacité de ce traitement, qui aide à réduire l'incidence de la carie dentaire chez les jeunes adultes, a été établie avec assez de certitude pour en justifier la généralisation dans la mesure du possible. On intensifiera encore l'emploi de ce procédé à mesure que le nombre des dentistes et des techniciens disponibles le permettra.

NOUVELLE NOMINATION

Le Quartier général de la Défense nationale vient d'annoncer la nomination du colonel J. F. Edgecombe, O.B.E., E.D., C.D., D.D.S., F.I.C.D., au poste de colonel commandant du Corps dentaire. Le colonel Edgecombe était colonel honoraire commandant de ce corps depuis janvier 1960 et la nouvelle désignation de ce poste est en tous points conforme à la ligne de conduite établie par le Ministère de la défense nationale.

analyse

CHIRURGIE MAXILLO-FACIALE: TECHNIQUE OPÉRATOIRE

R. Bataille, G. Béal, P. Cernéa, C. Crépy,
M. Grellet, J.-L. Grignon, M. Parant et R.
A. Vrasse. Paris, Juhen Prélât, édit., 1962.
380 p. Illustré. N.F. 73.00

Les livres qui traitent de chirurgie maxillo-faciale sont assez rares et ceux qui démontrent les techniques opératoires, encore plus.

C'est avec une grande satisfaction que nous avons lu le récent ouvrage présenté par le Prof. Cernéa, de Paris. Sans avoir la prétention d'un traité, ce volume groupe un recueil de premiers exposés qui avaient été faits au cours d'un enseignement de techniques chirurgicales dans le cadre de l'activité des services hospitaliers de Paris.

Chaque conférence est développée par son auteur avec la compétence que lui confère l'expérience de la pratique journalière de la spécialité. Tout est dit d'une façon précise et illustré encore par des schémas clairs, fort précieux.

Parmi les techniques courantes sur les dents, les gencives, la mâchoire, les nerfs régionaux, l'articulation temporo-mandibulaire, les grands vaisseaux, les glandes salivaires, il y a des descriptions qu'on a bien à chercher pour ne pas les trouver ailleurs sous une belle forme, comme "L'évidement ganglionnaire cervical," de P. Cernéa, et les "Ostéo-synthèses de la mâchoire supérieure," de C. Crépy. Deux rappels de techniques générales sur "La trachéotomie" et la "Réanimation cardiaque" sont bienvenus pour le

chirurgien maxillo-facial, qui peut être obligé d'y recourir, comme tout autre chirurgien.

Il y a aussi deux exposés sur les "Plaies et sutures cutanées" et les "Traumatismes de la région labiale et leur chirurgie restauratrice," de J. L. Grignon.

Ce livre d'une présentation agréable est un excellent travail qui fait honneur à ses auteurs et à l'Ecole de chirurgie maxillo-faciale de l'Hôpital St-Louis. C'est avec intérêt que nous attendons la suite.

G. de Montigny

congrès

Congrès de l'Association dentaire de la province de Québec à l'hôtel Reine Elizabeth de Montréal, les 23, 24 et 25 mai 1963

PROGRAMME SCIENTIFIQUE

Conférences

- "Analyse de la dentition mixte et extractions en série" — le docteur CLAUDE BARIL, assistant-professeur d'orthodontie à la Faculté de chirurgie dentaire de l'Université de Montréal
- "Prothèse dentaire" — le docteur JAMES MCCUTCHEON, doyen de la Faculté de chirurgie dentaire de l'Université McGill
- "Chirurgie pour l'omnipraticien" — le docteur J. H. JOHNSTON, ancien professeur de chirurgie buccale à la Faculté de chirurgie dentaire de l'Université de Toronto.
- "Les voies de propagation de l'infection dentaire" — le docteur ARTO DEMIRJIAN, assistant-professeur à la Faculté de chirurgie dentaire de l'Université de Montréal
- "Traitement conservateur du canal radiculaire"—le docteur HERBERT SCHILDER, Boston, Massachusetts, Etats-Unis

Pellicules cinématographiques

- "Technique de l'utilisation de l'amalgame pour les obturations"
- "Façon d'utiliser efficacement les services d'une assistante"
- "Dysfonctions de l'articulation temporo-mandibulaire: anatomie et traitement"
- "Prise d'empreinte pour la prothèse partielle"
- "Extraction de dents incluses"



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"Injection à l'épine de Spix"

"L'application des principes pour les implants aux deux maxillaires et confection de prothèses"

"Injections d'anesthésiques au maxillaire supérieur"

"Comment éviter les poursuites judiciaires"

Clinique télévisée

"Périodontie — Méthode pratique de traitement" — le docteur GEORGES PELLETIER, chef de section de périodontie à la Faculté de chirurgie dentaire de l'Université de Montréal et ses assistants

Cliniques de table

"Prothèse partielle" — JACQUES FISET

"Thérapeutique périodontaire" — GEORGES PELLETIER, ALLAN WAINBERG et MILTON DINES

"Analyse de la dentition mixte" — CLAUDE BARIL

"Pulpotomie" — RAYMOND LAVALLEE

"Rôle du crochet universel en prothèse partielle" — JACQUES BEGIN

"Traitement des complications en chirurgie" — W. B. DONOHUE

"Réhabilitation et implants" — I. L. FEINCHNEIDER

"Empreintes avec substances à base de caoutchouc pour incrustations" — HARRY ROSEN

"Trucs du métier en dentisterie opératoire" — CAPT. J. R. VINCENT

Exposition scientifique

"Illustration de l'enseignement moderne des diverses disciplines de la chirurgie dentaire" — Etudiants de la Faculté de chirurgie dentaire de l'Université de Montréal

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-) Démontre-t-il son habilité professionnelle et ses connaissances?
-) Essaie-t-il de vaincre la peur du patient?
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*Golden, S. S., Dankoff, M. H., Korcheck, D. L.: A Clinical Appraisal of the Anti-Inflammatory Effect of Streptokinase, O.S., O.M. and O.P., 11:11, 1244-1250. (Nov.) 1958.



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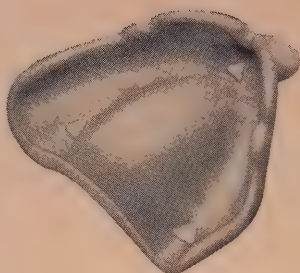
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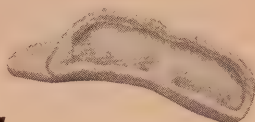
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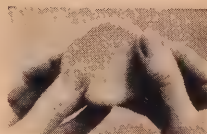
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Ref. 1. Truesdail Laboratories, Inc. Report Aug. 18, 1961.

2. Patrick D. Toto, D.D.S., M.S., Malburn Wilderman, D.D.S., M.S. and Charles Reeves, D.D.S.
Clinical Evaluation of an Oxygen Liberating Preparation Used Adjunctively in Root Planning.
Journal of Periodontology. Vol. 31. Jan. 1960

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1. Perkins, Robert E.L.: Oral Surgery, Oral Medicine and Oral Pathology 10:230, 1957.

2. Sherber, D. A.: Am. J. Surg. 86:331, 1953.

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1. J.A.D.A. 62:466 (April) 1961. 2. J.A.M.A. 180:94 (April 7) 1962.



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lead-er (lēd'ēr), *n.* 1. a person or thing that leads; directing, commanding, or guiding. 2. as of a group or activity. 3. a horse harnessed to a team, as of a group or activity. 4. a horse harnessed to a team, as of a group or activity. 5. a featured article or column in a newspaper. 6. a short piece of catgut or other material, used as a hook, lure, etc. to attract fish. 7. a newspaper. 8. in music, a person who directs the conductor of a dance band or orchestra. 9. in nautical usage, a wooden block or metal piece with holes in it, used to lead lines to their proper places. 10. *pl.* in printing, dots, dashes, etc. in a line, used to direct the eye across the page, as in a table of contents.

lead-er-ship (lēd'ēr-shīp'), *n.* [see -SHIP]. 1. the position or guidance of a leader. 2. the ability to lead.

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lead-in (lēd'in), *n.* 1. the wire leading from the aerial to a radio receiver. 2. a transmitter. 3. a leading in: as, a lead-in wire or cable for a lamp. 4. a covering or being covered with lead. 5. a covering or sheets of lead, collectively.

lead-ing (lēd'ing), *adj.* 1. the action of one that leads; guidance; 2. leadership. *adj.* 1. that leads; guiding; 2. chief. 3. playing the lead in a play, motion picture, etc. —*SYN.* see chief.

leading article (lēd'ing ar-ti-kul), *n.* 1. a principal editorial or article in a newspaper.

leading edge (lēd'ing ēj), *n.* 1. in aeronautics, the front edge of a propeller blade. 2. in nautical usage, that edge of the hull of a ship which first encounters the wind.

leading light (lēd'ing līt), *n.* 1. a light used to guide ships into and out of a harbor. 2. a light, one of the most important members of a community, etc.

leading question (lēd'ing kwes-tion), *n.* a question put in such a way as to suggest the answer.

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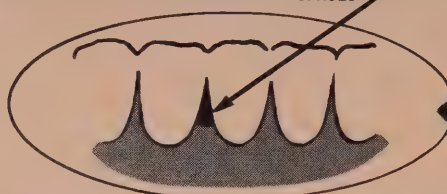
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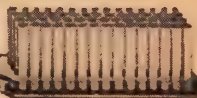
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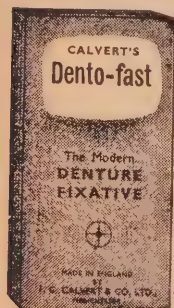
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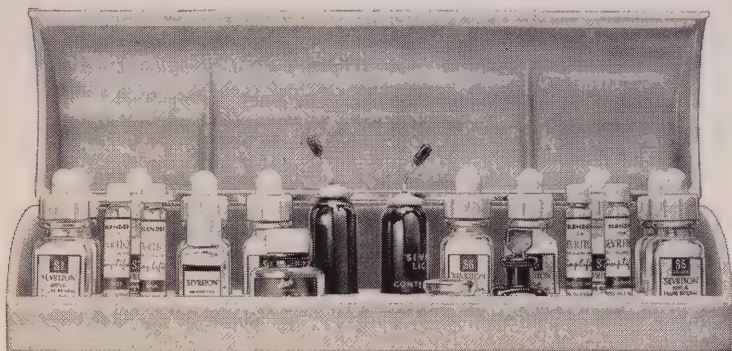
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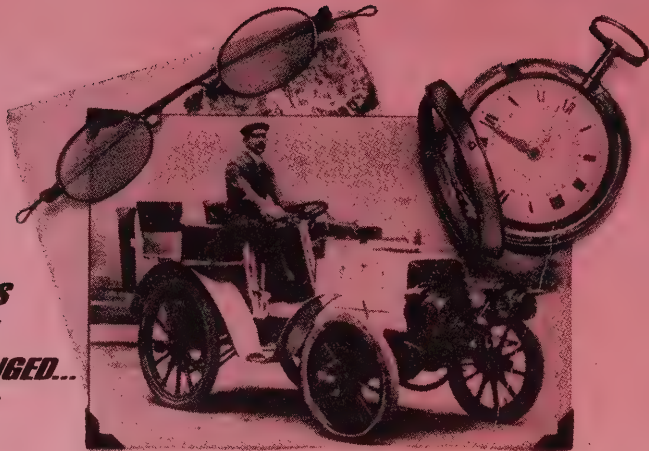
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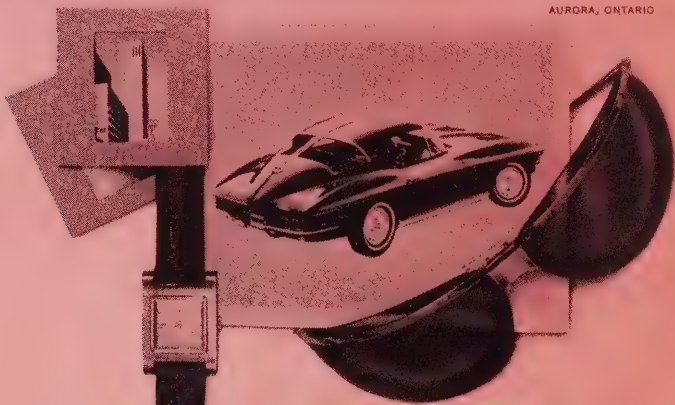
References: 1. Weil, C., Welham, F.S., Santangelo, C. and Yackel, R. F. Clinical Evaluation of Mepivacaine Hydrochloride by a New Method, J.A.D.A. 63:26 July 1961. 2. Dobbs, E.C., and Ross, N. The New Local Anesthetic, Carbocaine, New York State D.J., 27:453 Nov. 1961. Other references to Carbocaine total 156; more papers in press. Available reprints on request.

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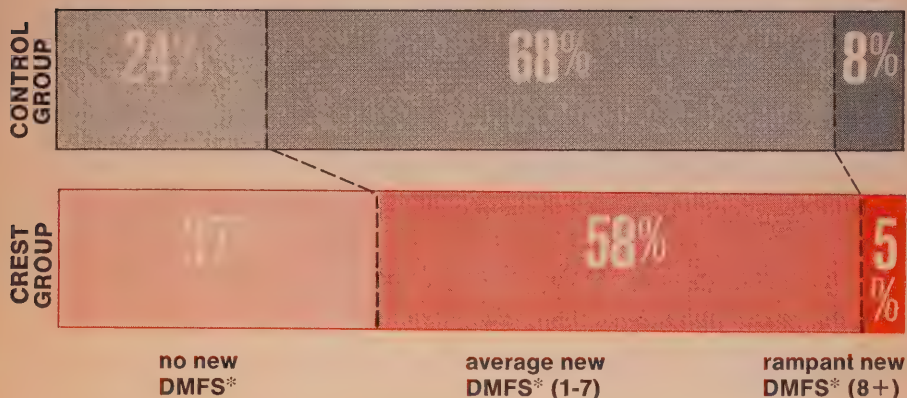
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*References: (1) Muhler, J. C.; Radike, A. W.; Nebergall, W. H., and Day, H. G.: J.A.D.A. 50:163, 1955. (2) Muhler, J. C.; Radike, A. W.; Nebergall, W. H., and Day, H. G.: J.A.D.A. 51:556, 1955. (3) Muhler, J. C., and Radike, A. W.: J.A.D.A. 55:196, 1957. (4) Muhler, J. C.: J.A.D.A. 64:216, 1962. (5) Personal Communication to Procter & Gamble.

***DMFS—DECAYED, MISSING, FILLED SURFACES**

See next page



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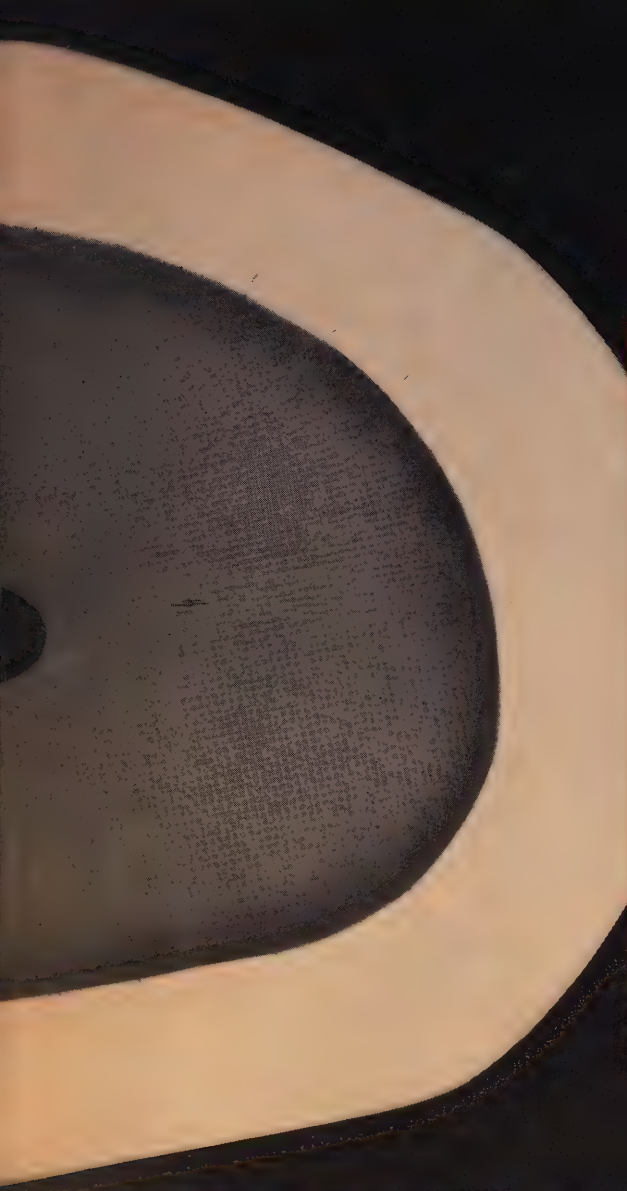
Enlarged x-ray microradiographs A and B visibly demonstrate the enamel-protecting effect of CREST. They show horizontal cross sections of an adult tooth which was bisected and treated with dentifrices. Section A was treated with the control dentifrice; section B was treated with CREST. For eight days, except during twice-daily treatments, both halves of the tooth were held

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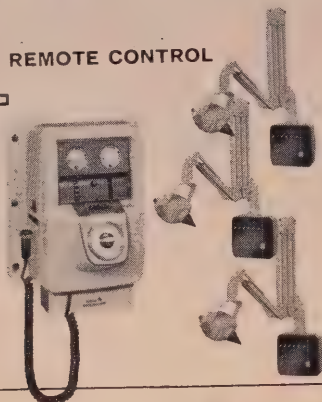
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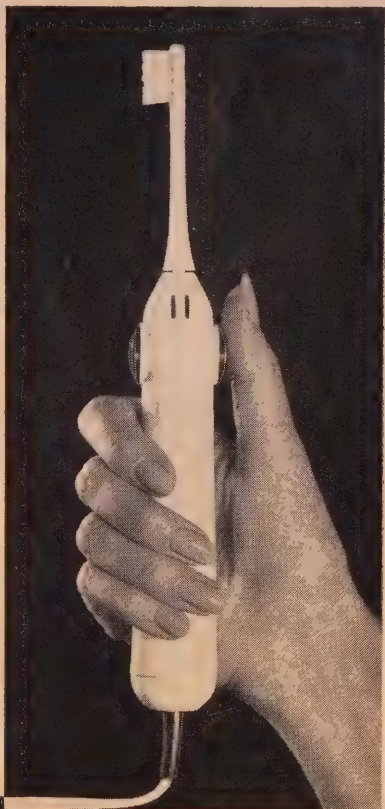
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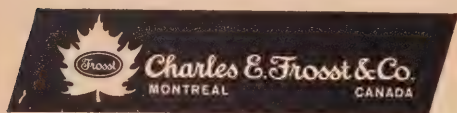
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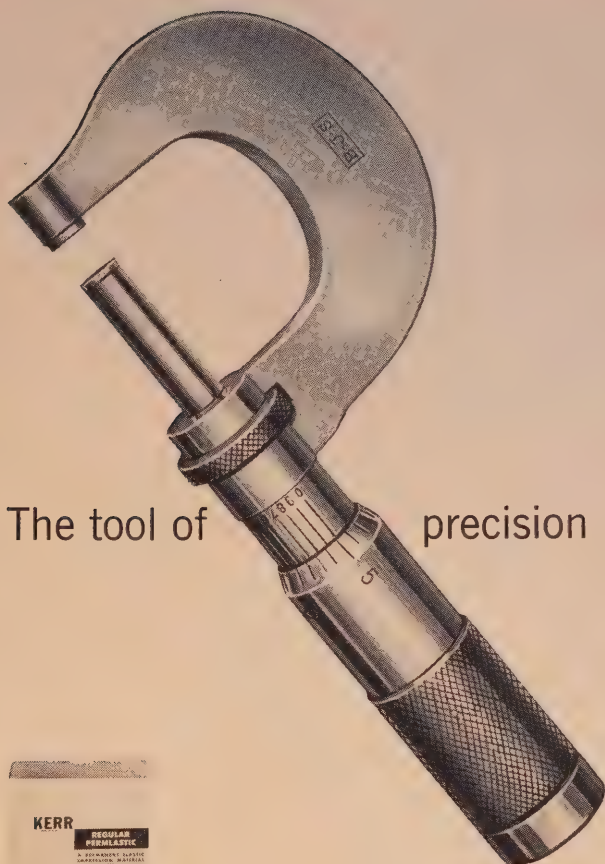
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2. Sherber, D. A.: Am. J. Surg. 86:331, 1953.





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Published monthly for the Canadian Dental Association by Gordon V. Allen Publications, 95 King Street East, Suite 205, Toronto, Ontario. Telephone 368 6251.
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Subscription price of Journal in Canada, Great Britain, the United States and all other countries, \$5.00 per year.

Authorized as Second Class Mail, Post Office Department, Ottawa, and for payment of postage in cash. All additions and changes of address should be sent to the Managing Director before the 20th of the month, to become effective the following month.

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The Canadian Dental Association

Volume 29

Number 5

Toronto

May 1963

JOURNAL

L'Association Dentaire Canadienne

Integration of periodontics in a general practice

James Sim, D.D.S., St. Catharines, Ontario*

The aim and purpose of dentistry is to preserve the natural dentition in health and function throughout life. It is recognized that this objective is idealistic. It is, nonetheless, the basic pursuit of every conscientious general practitioner, every teacher, and every research scientist in the dental profession.

In order to achieve this objective it is essential that all oral lesions be recognized and treated as early as possible, and that the dental care for every patient be as comprehensive as practicable. Early

recognition and treatment ensure a maximum opportunity for success with a minimum expenditure of effort. It promises greater satisfaction for all.

In order to fully understand the problem let us remember that in the human mouth the dentist is confronted with one of the great paradoxes in tissue repair. Contiguous tissues — the tooth and its periodontium — exhibit vastly different recuperative powers. Tooth structure (especially enamel) has limited recuperative ability, and yet the periodontium (especially the gingival tissue) will recover quickly from almost any insult

*Associate Department of Oral Diagnosis Faculty of Dentistry, University of Toronto.

which is not sustained over a long period of time.

Obviously the treatment of diseases of the tooth differs considerably from treatment of the periodontal tissues. "In no other medical field has a disease condition been so adequately handled by removing the infected part and restoring form, function, and aesthetics with an inert material as dentistry has done in the treatment of dental caries and the replacement of lost teeth."¹ However inadequate recognition and unsatisfactory treatment of the periodontal diseases constitutes one of the major weaknesses in the dental profession today.

Successful dental treatment ensures the preservation of a maximum number of healthy, natural teeth. A general practitioner cannot serve his patients well unless he assumes responsibility for investigation, recognition, and treatment, or the referral for treatment, of periodontal lesions. Treatment is in vain unless patients are instructed in methods designed to maintain adequate oral health.

THE PREVALENCE OF PERIODONTAL DISEASES

Studies on the prevalence of periodontal diseases vary widely in their methods and findings. It is, therefore, impossible to evaluate the current situation accurately. However, a review of the literature confirms the clinical observation that periodontal diseases occur very commonly.² It has also been demonstrated that destruction of the supporting structures increases in an almost direct ratio with advancing age.³

It is possible that the general practitioner sees almost as many periodontal as carious lesions. It has been shown, however, that only a small percentage of the affected patients are aware of the presence of periodontal disease, and that an even smaller percentage have received any treatment.^{4,5} The need for adequate examination, investigation and recognition is imperative.

In Canada there are approximately 18½ million people. They are served by almost 5,900 dentists of whom 24 are certified periodontists.⁶ A substantial number of the populace have periodontal disease. It is obvious that the periodontists cannot handle the problem alone. They require the co-operation and assistance of every general practitioner.

The value of early, simple, preventive periodontal therapy rendered by a conscientious, well-oriented general practitioner is inestimable. Treatment of the majority of periodontal lesions is well within the realm and capability of an interested, well-trained general practitioner. However, it is prudent to refer the more difficult cases to a periodontist for consultation and evaluation. His judgement as to case management should then be respected.

CLASSIFICATION OF PERIODONTAL DISEASES

A brief discussion of classification is included here. This classification is based on the need for recognition and understanding of the aetiology and pathology of periodontal diseases, as opposed to the identification of the various clinical manifestations.⁷

The vast majority (over 90 per cent) of periodontal lesions exist as a result of inflammatory reaction within the tissues.⁸ These lesions are commonly seen in general practice. Practical, effective periodontal treatment can easily be integrated into the concept of total dental care.

Inflammation of the periodontal tissues is described according to its extent. When the inflammatory change is confined to the gingival tissue the condition is called gingivitis; when the inflammation extends into the bone of the alveolar process and periodontal membrane it becomes periodontitis.⁹ Periodontitis may develop as a result of chronic gingivitis (e.g. chronic periodontitis simplex) or the deeper tissues may be affected at inception (e.g. early periodontitis complex).

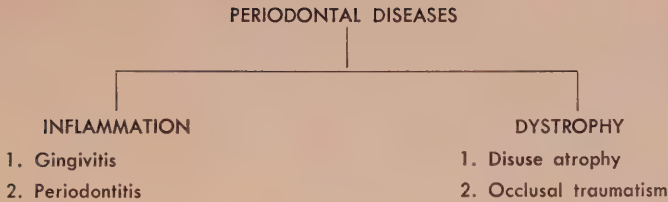


FIGURE 1 Classification of periodontal diseases.

In any discussion of treatment of periodontal diseases one must consider:

1. Elimination of the aetiological factors—that is, the injurious agents, and
2. Re-establishment of tissue health to prevent further progression of the disease.

Therefore it is essential to have an accurate concept of healthy periodontal structures and clinical criteria by which to evaluate this.

Clinical Criteria.—These are considered in terms of the gingiva, sulcus, epithelial attachment, and the teeth themselves:

1. *Gingiva.*—(a) Colour—uniform pale pink except for normal pigmentation when present. (b) Form—should fill the interproximal space in a knife-like edge closely adapted to the surfaces of the teeth. (c) Density—interdental papillae and free attached gingiva should be firm and dense in all areas.

2. *Sulcus.*—should not exceed 2 mm. in adults.

3. *Epithelial Attachment.*—Should be on the enamel or at the cemento-enamel junction in children and adults; it may be on the cementum in elderly individuals; but in any event it is not normally more than 1 mm. below the cemento-enamel junction.

4. *Teeth.*—Sound, firm teeth with which patient can chew comfortably.

Aetiology.—The aetiological factors in periodontal lesions of inflammatory origin may be divided into two broad categories:

1. Those which operate locally, and
2. Those which operate generally (i.e. systemically).

In order to put the systemic factors into true perspective, it should be realized that their significance in the aetiology of periodontal diseases has not yet been fully clarified. It may be, for example, that insufficient secretion of insulin in the diabetic patient could cause changes in part of the periodontium (e.g. osteoporotic changes in bone of the alveolar process). More specifically, and of infinitely greater importance, however, the systemic factor probably influences tissue response to local irritation, so that the reaction of the tissues is less favourable than it would otherwise be.¹⁰

In essence, and this is of particular importance to the general practitioner, local factors are by far the most significant stimuli in evoking inflammatory response in the periodontium. The systemic factors should be considered only as modifying influences on the progress of disease.

To be specific, the local factors include:

1. Dental accretions (plaques, materia alba, calculus)
2. Chemical agents

3. Bacteria
4. Mouth breathing
5. Faulty oral physiotherapy (inadequate procedures necessary for maintenance of satisfactory oral hygiene)
6. Faulty dental restorations and appliances
7. Removal of teeth without replacement
8. Occlusal trauma¹¹

Of all these, the two most significant factors in the aetiology of periodontal diseases of inflammatory origin are calculus (both supra and sub-gingival), and the sequelae to the non-replacement of missing teeth.

NEED FOR COMPLETE EXAMINATION AND SIGNIFICANCE OF THE COLLECTED DATA

Examination.—Examination and treatment planning have been discussed elsewhere in this issue. However, because accurate oral diagnosis is essential in planning therapy it seems prudent to mention the subject once again. Treatment, to be of value, must be specific. In order to be specific in planning treatment the clinician must have an adequate fund of information. To collect this information quickly and intelligently it is necessary to develop a system that is sufficiently detailed yet completely practical.

It is apparent that three examination procedures are needed:¹²

1. The emergency examination, used to uncover the cause of acute distress.
2. The screening examination, used routinely to recheck for new carious lesions, irritants, and recently developed lesions in the periodontal structures (commonly referred to as a recall examination and usually augmented by cavity detecting radiographs).
3. The complete examination, used for initial evaluation of a patient requiring total dental care, and periodic re-examination of a patient presenting on a regular maintenance program. (This examination is augmented by a complete radio-

graphic examination and numerous other auxiliary tests.)

The emergency procedure and the recall examination are used routinely in general practice. It is felt, however, that the complete examination is not utilized to the fullest extent and, as a result, many incipient periodontal lesions lie undetected for a long time.

Significance of the Collected Data.—Once the information has been collected, classified and evaluated, its significance can be assessed, and reasonable treatment formulated. Unless a routine is established whereby this procedure is automatically a part of a general practitioner's plan of practice, disease processes will continue to lie undetected and untreated. No other single procedure can be of greater value to the dental patient than a thorough examination and a carefully rendered oral diagnosis and treatment plan.

If developed as a matter of routine, complete examination and planning procedures are found to be readily accepted by dentists and their patients, proving to be of inestimable value to all. The scope of practice is thereby extended; the challenge and responsibility for the maintenance of oral health enhanced; the value of treatment and the satisfaction derived in rendering it, are increased. Sound examination and treatment planning procedures in general practice are essential. The benefits to both patient and dentist are far-reaching.

INFLUENCE OF DENTAL PROCEDURES ON THE PERIODONTIUM

For many years the profession has paid lip-service to the philosophy that restorative procedures should be integrated with periodontal services in an effort to protect the periodontium, and to maintain the natural teeth in health and function. This is a most commendable attitude. Unfortunately, the practical

realities point to a situation which is almost exactly the reverse.

Restorative Procedures. — Faulty dental restorations and appliances are high on the list of aetiological factors in periodontal disease. The frequency of occurrence and prolonged effect of these man-made irritants is of immense significance. The importance of faulty restorations as aetiological factors in periodontal disease must be stressed. It is essential that an attitude be developed and projected which will make the dentist aware of his responsibilities to protect the supporting structures. All our routines may be potentially damaging. It is imperative that we remain aware of this, and that our treatment procedures are planned to reduce this danger to a minimum.

There are some general rules to be observed during clinical practice which will help to prevent damage to the periodontium and ensure that treatment rendered will serve longer and more usefully, and be of greater benefit to the patient.

In all restorative procedures it is essential that:

1. A satisfactory functional occlusion is re-established.
2. The supporting structures are protected.
3. The integrity of both arches is maintained.
4. The contact relationship of all the teeth is preserved, and that
5. The total effort contributes to mastication, aesthetics and phonetics.¹³

In fabricating an individual restoration one should provide:

1. Functional occlusal contact
2. Proper contour and form
3. Natural anatomic form with adequate marginal ridges and spillways
4. Oval interproximal contact areas
5. A restoration which is polished and finished to simulate the lost natural structure it replaces.

Carefully designed and executed restorations protect the underlying structures from the traumatic effect of rough overhanging margins, food impaction and

other insults. The goal of restorative dental procedures is to reproduce natural functional form.¹⁴

Removable Prostheses. — Removable prostheses (partial dentures) of a conventional nature (e.g. with clasps, bars, etc. in contrast to those with precision attachments) are extremely difficult to design for stability. A certain amount of movement seems inherent with them. These partial dentures tend to be somewhat irritating to the supporting teeth and underlying tissues. Undue stress exerted on the supporting teeth will weaken the periodontal support. It is imperative to design these appliances carefully, using wherever possible cast metal skeletons supported by properly prepared clasps and rests.

Orthodontic Appliances. — Orthodontic appliances frequently contribute to periodontal disturbances.^{10, 15} This sometimes is unavoidable, but every effort should be made to place the appliances in such a manner as to avoid impingement on the gingival tissues. In addition one should attempt to ensure a high standard of oral physiotherapy to relieve food impaction and prevent stagnation. Needless to say the orthodontic forces should be kept within physiological limits to prevent damage to the periodontium and avoid root resorption.¹⁶

Oral Surgery. — Surgical procedures should also be planned to protect the periodontium. The injudicious and excessive use of force should be avoided. Flaps should be designed so that, when replaced, healing will occur uneventfully. Reasonable physiological tissue contour should be maintained. Suturing should be neat. If necessary, it is sensible to combine periodontal curettage with the removal of an offending tooth. A dentist should combine every aspect of therapy, if possible, in a program of total dental care.

A general practitioner is given the opportunity to render a complete and inte-

grated program of treatment. All patients would be served better if this philosophy were adopted by the majority of dentists.

INTEGRATION OF DENTAL PROCEDURES IN PLANNING THE TREATMENT OF PERIODONTAL LESIONS

Although each patient has to be considered on an individual basis, there are certain fundamental principles which apply to the management of periodontal diseases. Treatment procedures may be divided into four main phases:¹⁷

1. The systemic phase
2. The hygienic phase
3. The corrective phase, and
4. The maintenance phase.

Systemic Phase.—The goal of systemic therapy is to improve the systemic and local response to injurious agents, and to facilitate healing by improving the general recuperative power of the body. Periodontal diseases cannot be cured by systemic therapy alone. The direct effect on the periodontal lesion will be limited; but the constitutional status of the patient must be considered.

For example, patients with a history of cardiac damage require special consideration as do those persons with blood dyscrasias. Uncontrolled diabetics present unusual problems because of their poor resistance to infection and altered metabolism. Obviously those persons who present with malignant neoplasms require special attention. Treatment may be drastically altered or curtailed in these instances. It may be necessary to limit procedures to those required for the relief of acute pain, and the elimination of gross sepsis. In the systemic phase local treatment procedures are evaluated against a broad clinical background, which includes physical and psychological evaluation of the individual (e.g. age, nutritional state, past dental history, past medical history, systemic disease, etc.).

Hygienic Phase.—The hygienic phase includes the scaling of teeth, the removal

of gross overhanging margins of restorations, the insertion of temporary restorations and splints, and the removal of hopelessly involved teeth. During the hygienic phase use is made of periodontal packs (displacement packs and germicidal dressings) for the elimination of bacterial irritation, the reduction of inflammation and oedema, and the relief of soreness in the tissues. The packs also help to produce recession of the gingival tissues, exposing underlying calculus and facilitating subgingival scaling.

The goal of the hygienic phase of treatment is to create a healthy local environment. During this phase the patient must also be instructed in an adequate program of oral physiotherapy. Proper home care is essential if therapy is to be effective.

The ability of the dental team (dentist-hygienist-assistant) to project the need for co-operation by the patient in a sound program of oral physiotherapy is extremely important. The enthusiasm with which these ideas are delivered is reflected in the patient's response and attitude. Success in this simple phase of therapy is just as important as technical proficiency in treatment procedures.

On completion of this hygienic, or conservative, phase the response to treatment is evaluated. The patient's co-operation is observed and recorded, and follow-up instruction is given as required. The observations made serve in planning further treatment. They may be influential in modifying the procedures originally projected. The clinician is thereby afforded the opportunity to observe the patient carefully and critically, and to alter his initial treatment plan as warranted by the circumstances. Most of the treatment outlined in this phase of therapy can, and should, be readily undertaken by the capable general practitioner.

Corrective Phase.—The corrective phase of periodontal treatment should be designed to eliminate those aetiological factors which remain after the hygienic phase has been completed. In essence it

may be divided into three parts:

1. The procedures necessary to correct occlusal disharmony.

2. The operative and restorative procedures required to return the dentition to optimum health.

3. The surgical procedures which will be used to eliminate residual periodontal pockets.

The operative and restorative procedures outlined above are those in which the general practitioner is usually most proficient. However, what is required in addition to normal talent is an adequate working knowledge — a reasonable concept and understanding—of the principles of occlusion.

Here is where help is most often needed, and when required it should be available. The certified specialist has a duty to the patients referred to him for treatment, and a further duty to help and guide the referring dentist in his restorative and corrective procedures.

If surgical procedures are planned the periodontist may be asked to perform treatment. This is reasonable; but there are many periodontal operations which can be completed comfortably and effectively by a well-trained general practitioner. This depends on the individual clinician—his interest and ability. The assistance offered here by the specialist can be of great help to the general practitioner and will serve to stimulate attention throughout the profession.

Maintenance Phase. — Provided treatment has been carried to a successful conclusion, the responsibility for maintenance rests largely with the patient. No effort should be spared in making the patient aware of this vitally important phase of therapy.

If co-operation is poor the benefits of treatment will not be maintained, and no matter how skillfully treatment has been rendered, it will fail. It is the dentist's duty to ensure that the patient has been instructed in a correct program of oral physiotherapy. It is also necessary to su-

pervise this program, checking progress periodically.

The patient should be recalled as often as is necessary to maintain satisfactory oral hygiene, and to arrest the incidence of fresh caries. If the patient will not, or cannot, keep the mouth clean and healthy, treatment may have to be discontinued or drastically revised. At these recall appointments the patient's co-operation should be reviewed, and treatment procedures re-evaluated.

An efficient recall system is a fundamental factor in this program. On recall, cavity detecting radiographs are made, and the health of the periodontal structures is checked. The teeth, the periodontal tissues, and the occlusal function should now conform to the ideals described earlier.

TREATMENT PLAN

In practice it is desirable to integrate the various phases of treatment into an organized plan. In this way each particular clinical service will be considered as a matter of routine. This will result in more comprehensive and effective treatment planning than is currently considered feasible.

A suggested outline follows:

1. Complete clinical and radiographic examination, consultation, oral diagnosis and case presentation.
2. Emergency treatment.
3. Removal of hopelessly diseased teeth.
4. Endodontic treatment.
5. Periodontal treatment (a) conservative; (b) occlusal adjustment; (c) surgical and corrective.
6. Operative and restorative treatment.
7. Prosthetic treatment.
8. Maintenance and recall program.

This outline provides a guide for planning treatment. The integration of periodontal therapy in a program of total dental care is stressed, and the value of such well-planned treatment is emphasized. Careful examination and diagnostic procedures provide a sound foundation

for comprehensive treatment planning.

Selection of restorations is a matter of choice. All restorative materials have their place. If cavity preparation is sound and the material is used according to directions, the finished restoration will serve very well. However, the number of dental materials in routine use is considerably smaller than the variety which is available. Gold foils, for example, are sensible, functional and extremely conservative restorations. They serve the teeth and the periodontal structures well. However, the paucity of gold foil observed in clinical practice indicates that the material is not being used to full advantage.

There are one or two other points to consider from a periodontal aspect. First, it can be demonstrated that most dental materials will serve best if placed in a dry field. The value of the rubber dam in operative dentistry is tremendous. If possible, one should strive to make the use of the rubber dam the rule rather than the exception. Certain materials (for example silver amalgam) are not contaminated in the complete absence of saliva; other materials are more critical and cannot even be used in the presence of moisture.

The majority of posterior restorations used in general practice are silver amalgam. In order to protect the periodontium these restorations should be inserted with a rubber dam in place, mixed exactly as directed, and firmly condensed. If the cavity is complex the matrix bands should be properly contoured, wedged at the gingival margin to prevent extrusion of material into the interproximal area, and braced with low fusing compound for stability. Silver amalgam restorations should be carefully carved to restore the natural anatomy of the lost tooth structure. These restorations should be polished, and the margins finely finished.

A good silver amalgam restoration will serve a long and useful life. It is a practical and extremely economical restoration. If well done it will protect the supporting structures and help prevent the

inception of periodontal disease. The same principles outlined earlier hold true for synthetic porcelain, self-curing acrylic resin, gold foil, cast gold and the diverse replacements available.

A conscientiously planned, thoroughly executed and soundly integrated program of dental treatment will serve extremely well. This therapy, and the subsequent maintenance program, will keep the patient free of pain and infection, and will help maintain the natural dentition for maximum useful life. The value of such treatment is inestimable.

SELECTION OF PATIENTS FOR PERIODONTAL THERAPY

The basic principles, objectives and methods of treatment have been briefly outlined. The next step is to consider the factors which indicate or contra-indicate acceptance of a patient for treatment.

Indications. — Periodontal therapy is indicated:

1. Provided that the disease process is recognized reasonably early, and
2. It is possible to identify and remove the aetiological factors;
3. If the patient's attitude is reasonable and a moderate degree of co-operation is anticipated;
4. If the patient is in good physical health, and
5. Presents with a dentition which may be restored to adequate function;
6. If the supporting bone is well calcified, providing sufficient support;
7. Where a reasonable number of teeth remain; and
8. Provided that mobile teeth can be stabilized.

Contra-indications. — Periodontal therapy is usually contra-indicated:

1. If the disease is recognized late, and where extensive (50 per cent plus) destruction of the supporting bone has occurred;

2. If it is deemed impossible to remove the aetiological factors;
3. Where idiopathic disease is present;
4. If the patient's attitude is unco-operative and interest and understanding are lacking;
5. If the physical health of the patient is poor;
6. Where periapical involvement complicates extensive periodontal destruction;
7. If pockets extend to the apices of the teeth;
8. Where an insufficient number of teeth can be retained to support prostheses; and
9. Where extensive bifurcation and trifurcation involvements exist.

Careful patient evaluation and orientation, detailed examination of the oral cavity, and sound treatment planning are indispensable factors if success is to be achieved in the integration of periodontics in general practice.

CONSULTATION AND PATIENT ORIENTATION

Prevention of disease is the goal of all phases of medicine and dentistry. Preventive measures are concerned with the sound structural development of the various parts of the body, and their maintenance in health and function through suitable nutrition, care and cleanliness.

When disease has intervened it is necessary to render treatment. The purpose of therapy is to restore the tissues to health and function. Reparative procedures are designed to prevent the further progress of disease and create an environment which will help to maintain the benefits of treatment. This is a basic philosophy of practice.

In order to gain patient co-operation and understanding, and to develop suitable rapport, it is essential to deliver this philosophy in capsule form at the outset. The methods by which this objective is achieved may vary; but the goals are always the same:

- to make the patient aware of the situation which exists, in a kind and forthright manner;

- to help the patient understand the problems which present and what may be expected during and after treatment;

- to gain the patient's confidence;

- to explain the division of responsibility in a plan of complete care; and

- to allot both the patient and the dentist their fair share of the responsibility in the maintenance program.

Consultation and case presentation should be done in an atmosphere of confidence and good-will. If the presentation has been preceded by a careful collection of information, and if the proposed course has been carefully and intelligently formulated, treatment will appear sensible and desirable to the patient.

Once this has been achieved, it is important that a clear statement of the prognosis be made. The probable result of treatment should be predicted and the expected length of life of the teeth should be given. The prognosis should also include a forecast of what is likely to occur if no treatment is undertaken.

The objective is to help the patient evaluate his condition, discuss it sensibly, and arrive at a rational decision. Acceptance or rejection of treatment is the patient's prerogative, and his alone; our duty is to educe the facts, guide and advise him carefully.

SUMMARY

Early identification and classification of all periodontal lesions is imperative. Examination procedures, oral diagnosis and treatment planning should all be as comprehensive as practicable for each patient. Periodontal diseases are extremely prevalent, and because there are relatively few certified specialists in periodontics, the role of a well-oriented, conscientious general practitioner in dealing with the problem is extremely important.

This discussion is limited to a consideration of periodontal lesions which exist

as a result of inflammatory reaction within the tissues. The aetiological factors are listed and their relative significance noted. Examination procedures are briefly reviewed and their importance evaluated.

The influence of general dental procedures on the periodontium is assessed in several phases of clinical practice. It is concluded that the general practitioner has a real opportunity available to render a well balanced program of treatment for the individual patient.

The integration of general dental procedures in planning for the treatment of periodontal lesions is outlined, and the importance of a sound recall program to maintain tissue health is emphasized. Finally, there is a brief resume of the factors to be considered in patient evaluation and reference to the importance of consultation and patient orientation.

RÉSUMÉ

Il est nécessaire de déceler et de classer, à son tout début, toute lésion péri-dentaire. Les procédés utilisés pour l'examen, le diagnostic et le plan de traitement doivent, quand la chose est possible, être mis en oeuvre pour tous les patients. Les maladies péri-dentaires se rencontrent fréquemment et il est bon que l'omnipraticien consciencieux, parce que le nombre des périodontistes certifiés est restreint, assume ses responsabilités d'une façon intelligente en face de ce problème.

Cet article se borne à exposer les lésions péri-dentaires qui sont le résultat d'une réaction inflammatoire à l'intérieur des tissus; il en énumère les causes et note leur importance relative; il passe brièvement en revue les méthodes d'examen et signale leur valeur.

Il évalue l'effet des traitements dentaires en général sur le parodonte.

L'auteur conclut que l'omnipraticien, dans ce domaine, a l'occasion de prodiguer à son patient une gamme équilibrée de

traitements. Il expose comment l'intégration du traitement des lésions péri-dentaires peut se faire au cours des traitements ordinaires et le devoir qui incombe au praticien de revoir son patient à des périodes fixes pour qu'il puisse maintenir ses gencives en bon état.

Enfin, on trouve dans cet article un court résumé des facteurs qu'il faut considérer quand on examine un patient et la procédure à suivre quand on a besoin d'une consultation avec un périodontiste. On y lit aussi la description d'une façon d'exposer au patient l'importance de l'entretien de ses gencives.

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Diagnosis and treatment planning for the periodontal patient

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It is accepted generally throughout the health professions that, that which is not diagnosed cannot be treated, while that which is diagnosed incorrectly cannot be otherwise than treated wrongly. What then is essential for a correct diagnosis? Since diagnosis is by definition the art of identifying a departure from normal it follows that in periodontics, as in any other field, it is essential to have a clear picture of what is normal, before attempting to recognize any deviation from this state. With the foregoing facts in mind the dentist is ready to advance, step by step, along the road most likely to lead to a correct diagnosis. The first step along this road is the taking of a history. Although this history always should conform to a definite pattern, the information should be gained in a leisurely, casual fashion, calculated not only to put the patient at ease, but to give the dentist an opportunity to view his patient as a person. Every practitioner knows that much important and relevant information as to the patient's temperament, tenacity of purpose in regard to treatment planning, etc., may be gleaned from a friendly, and apparently inconsequential conversation.

HISTORY TAKING

As is routine in any case history, personal data, such as name, address, age, occupation, and marital status, should be noted first.

The patient then should be questioned as to what prompted him to seek dental advice. The answer may be one main symptom, such as bleeding gums, or it

may be a variety of complaints, all of which should be noted carefully for future reference.

At this point the dentist should endeavour to establish as accurately as possible how long the condition has existed, whether it is constant or intermittent, and, if the latter, whether the attacks follow any regular pattern.

Other facts which should be obtained from the patient are the type and degree of pain, if any. If bleeding of the gums is a symptom, it should be ascertained as to whether this is precipitated by brushing or whether it occurs spontaneously. The patient should be asked, too, whether any other symptoms, such as movement of the teeth, unpleasant breath, or a bad taste in the mouth have been noted.

When taking a history such as this, it is important not only to elicit information as to past periodontal treatment, if any, but also to request information of other dental ailments, paying particular attention to those which may have involved the use of appliances, or required extensive surgical intervention. Not only does such information provide the dentist with possible aetiological factors, but it allows him to assess just how basic is the patient's regard for oral health.

Various conditions, such as anaemias, diabetes mellitus, vitamin deficiencies, and pregnancy, may alter local tissue response to irritation, while heart disease, pulmonary disease, and psychiatric disorders, as well as blood dyscrasias, may affect the choice of treatment and the choice of anaesthetic. It is obvious therefore that a medical history should be obtained from the patient insofar as it is

pertinent to oral health. The record of a female patient should include data relative to her menstrual and obstetric history. In the recurrent type of periodontal disease this information may be of considerable significance. Despite the fact that a negative answer may be obtained when the patient is questioned as to systemic conditions, inquiry should always be made about hospital confinement, or past surgical procedures, since this may underline the advisability of consultation with the patient's medical adviser. It may provide, too, a clue as to the aetiology of the periodontal condition under investigation.

The knowledge gained during the history taking is invaluable, and the dentist will find that the patient's answers invariably furnish him with much more information than that directly sought by

the actual questions. Time and again he will have reason to be grateful for the time spent in this taking of a detailed history. So often when success seems to elude him he will discover that another intensive sifting of the history will pinpoint some fact missed or considered irrelevant in the first instance. From time to time certain patients are reluctant to provide answers to those queries which in their opinion do not seem to them to relate directly to the oral cavity. Since this attitude almost always stems from lack of knowledge of the communication system between the periodontium and the rest of the body, the patient usually reacts well to a simply worded explanation of the significance of such information.

A sample type of case history is shown in Figure 1.

FIGURE 1 Specimen case history.

PATIENT'S NAME: Miss G. G. DATE: 5 June 1961
ADDRESS: 20 Elm Street, City AGE: 21
OCCUPATION: Stenographer

PRESENT COMPLAINT: Recession of "gum" over the labial surface of $\overline{1}$ and $\overline{3}$.
 This was first noted one year ago when all her gingivae were painful and bled easily.

PREVIOUS PERIODONTAL TREATMENT: None
ORAL HYGIENE: Fair
FREQUENCY OF BRUSHING: Twice daily, morning and evening.
TYPE OF BRUSH: Soft nylon METHOD OF BRUSHING: Circular motion
SIGNS OF TOOTHBRUSH TRAUMA: Nil
DEBRIS: None STAINS: None CALCULUS: Slight on lingual of lower incisors.
MOBILITY: Class 1 on $\overline{1}$. MISSING TEETH: None
GINGIVAL COLOUR: Pale pink except in $\overline{1}$ area where it is cherry red.
TEXTURE: Smooth in lower anterior region and lingual aspect of lower molars on both sides. Elsewhere the gingiva is stippled.
CONTOURS: Normal, apart from the recession around $\overline{1}$ and $\overline{3}$. Note high muscle attachments in both areas.

PERIODONTAL HISTORY: Painful bleeding gingiva in spring of 1960. This was treated with a proprietary mouthwash prescribed by her dentist. Shortly thereafter she became aware of the recession over $\overline{1}$ and $\overline{3}$. The gingiva in these areas continued to bleed and remained tender after the remainder of the gingival tissues returned to normal.

SYSTEMIC HISTORY: Rheumatic fever at age 13. Allergic to penicillin. No other serious illness. No operations. Menstrual cycle regular (4/28). No dysmenorrhoea. Diet good.

POCKETS: 8765432112345678
8765432112345678

OCCCLUSION: Good

QUESTIONABLE TEETH: None

EXTRACTIONS ADVISED: None

PERIODONTAL DIAGNOSIS: Periodontitis simplex

AETIOLOGY: Calculus, poor oral hygiene, and damage caused by acute necrotic gingivitis in 1960 are the possible reasons for the breakdown on the lingual aspect of the lower molars and bicusps. High muscle attachments appear to be the factors responsible for the recession on the labial aspect of $\overline{1}$ and $\overline{3}$.

ORAL RECONSTRUCTION: Nil

OTHER ORAL LESIONS: Nil

PROGNOSIS: Good, provided patient's co-operation is obtained.

TREATMENT PLAN: (1) Consult with the patient's physician regarding history of rheumatic fever and allergy to penicillin. (2) Scaling and muscle attachment resection under cover of an antibiotic such as tetracycline (Achromycin). (3) Correct oral hygiene technique. (4) Observe.

EXAMINATION

As the second step the dentist now logically proceeds with the clinical examination. This affords him the opportunity of corroborating, or disagreeing with, the information gained from the patient during the compiling of the history. In the main, however, the purpose of the clinical examination is to detect any abnormality present in the oral cavity. To this end, a careful inspection of the dental arches should be made. The inner cheek, the lips, the tongue, and indeed the oral mucosa as a whole should be scrutinized so

that any irritation from cheek biting, ill fitting appliances or roughened tooth edges may be discovered and eliminated where possible. It is in those areas too that signs of neoplasms, mucous cysts and other abnormalities may be discovered. A careful survey should be made of all restorations in order that any overhanging edges, or poorly contoured surfaces, which may affect the gingiva, can be corrected. The temporomandibular joint should be examined and the need for replacement of restorations assessed. Attention should be given, too, to the presence of enlarged lymph nodes. When

overall inspection of the mouth has been completed, the attention should next be directed to the teeth themselves. A study should be made of each individual tooth and its surrounding structures. Any findings as to caries or attrition are recorded, while any tooth, where pulp involvement is suspected, should be tested for vitality.

The position of each tooth should be noted carefully. Any migration may be one of the earliest signs of periodontal disease as well as ultimately causing food impaction and stagnation areas which in turn contribute to marginal gingivitis and acute periodontitis. Individual teeth should be tested for mobility by holding the tooth firmly between the index fingers of the right and left hand and applying gentle pressure in an attempt to move the tooth in all directions. The results of this test should be recorded on the chart as falling into one of three categories: grade 1 — slight mobility; grade 2—moderate mobility; grade 3—marked mobility.

While the normal tooth will move very slightly in response to pressure, any departure from a state of immobility should be viewed with suspicion. The following clinical assessment is recommended for the convenience of practitioners. If the tooth moves at all it is classed in category one. If the tooth can be depressed more than one millimetre or moved to a similar degree in any direction, it is classed in category three. Category two comprises teeth with any mobility within these limits.

The degree of function of each tooth should be established. When teeth are removed or fail to erupt, the functional relationship of the dentition may be sufficiently affected, so as to contribute to the patient's periodontal problem. Where examining the functional relationship of the teeth, the finding of an apparently normal dentition, when the jaws are in a closed position, should not be accepted as excluding the need for further investigation. Any oversight here might well result in a faulty diagnosis.

The average occlusion, although it may not be perfect, is usually compatible with a healthy periodontium. For this reason it is not always necessary to make a finely detailed examination. It is always necessary, however, to record any abnormalities of the overbite, and overjet, and conditions such as unilateral or bilateral crossbite. Any deviation from the midline path should be listed, while the temporomandibular joints should be palpated and any clicking or grating during movement noted. In the same way any premature or traumatic contacts, which occur when the occlusal surfaces of one pair of opposing teeth meet before the remaining teeth make contact with each other, should be recorded. Since the commonest cause of premature contact is a poorly contoured restoration, particular attention should be given to any gold inlays since here premature contact may last long enough to precipitate periodontal embarrassment.

A note should be made regarding the degree of calculus formation as well as the amount of stain and food deposit visible on the tooth. For recording purposes the type of calculus visible to the naked eye is termed supragingival, while that detectable only by a probe or other mechanical aid is considered subgingival.

In the first comprehensive view of the gingiva, it is possible to see certain indications which at once should alert the practitioner to the likelihood of periodontal disease. Included here are such signs as swelling of the gingiva, or loss of stippling, as well as changes in colour, or recession. Before a diagnosis can be attempted, however, at least with any degree of surety, it is essential that a detailed and systematic examination be made.

First, the texture of the soft tissue should be noted. Any loss of stippling, or suggestion of glazing, is suggestive of inflammatory oedema.

Colour is important. If this has deepened from the normal pink to a shade of red, or if the line of demarcation between the pink of the gingiva and the

red of the mucosa is no longer visible, this must be recorded.

The contour of the gingiva may help considerably in the making of a diagnosis. Close attention should be given to the area between the teeth. Here, for instance, a peculiar formation of the gingiva, known as saucerization and typical of Vincent's ulcerative gingivitis, may be observed. Such signs as divided papillae, festooning of the margins, or any indications of possible cleft formation, in this area should likewise be noted.

Since the normal gingiva is firm and resilient, consistency of the patient's gingiva should be tested by pressing gently against the tissue with a blunt-ended instrument such as a William's probe. If oedema is present, the pitting caused by the pressure will tend to linger. But if after momentary blanching the tissue resumes its original form, it may be assumed that no excess fluid is being retained in the tissue.

Any gingival pockets present should be investigated carefully with a view to determining their depth and extent. The best method of doing this is with a William's probe. The probe is passed gently between the tooth and the gingival margin until the base of the pocket is felt. Care should be taken to maintain the probe in a position as nearly parallel as possible to the long axis of the tooth. Certain measurements should be ascertained and noted. Specifically, these are the depth of the pocket taken buccally, lingually, mesially, and distally.

The degree of recession of the gingiva may also be recorded at this time, and special attention should be paid to the presence of high muscle attachments, and their relationship to any areas of recession.

In an effort to establish whether pus is present in gingival pockets, the ball of the index finger should palpate the gingiva in an upward circular fashion. Careful observation is required in order that not even the slightest output of purulent exudate be overlooked. It is helpful, too, at this stage, to remember that any sign

of pain shown by the patient as the gingiva is palpated may well indicate some infection deep in the tissue.

While periodontal disease affecting the bifurcation and trifurcation areas might be more correctly discussed under the heading of periodontal problems, it would seem that some mention of involvement of those areas should be made here. Where a multi-rooted tooth is affected, it is important to know how deep and how wide the pocket is, and how far it extends toward the median line of the tooth. For this purpose a curved probe, such as a No. 2 Clev-dent explorer should be used.

While the foregoing may be all that is required in many cases in order to make a complete and accurate diagnosis, other diagnostic aids to a correct diagnosis may be brought into service.

Of these the one most frequently used, and perhaps the most valuable, is the radiograph. There is much to be said in favour of having radiographs to hand before beginning the clinical examination. It should be stressed, however, that radiographs alone cannot, and should not, be used to replace the detailed and systematic case history and clinical examination. But radiographs can do much to corroborate a diagnosis as well as provide a useful record of the patient's condition before and after treatment. Radiographs are also helpful in establishing the position of the alveolar bone in conditions such as suspected chronic periodontitis, and in estimating bone loss in periodontal disease. This is done by estimating the amount of bone that remains, as compared to the amount of bone considered normal in a particular patient. Radiographs are also invaluable in determining the extent of lesions in the deeper areas of the periodontium.

Cases involving malocclusion may necessitate the preparation of study casts as an adjunct to the clinical examination. Occasionally smears or bacterial cultures may be indicated to clarify the clinical picture, and should certainly be obtained to aid in differential diagnosis.

A specimen chart for recording clinical observations is illustrated in Figure 2.

In both the compiling of the case history and the clinical examination, method is the essence of success. Without it not only will a great deal of time be wasted, but much information may be overlooked. Once the dentist possesses all the data pertaining to his patient, he must analyze the findings so as to determine the condition from which the patient is suffering. Moreover, he must ascertain the precise ætiological factor. Successful and effective treatment not only restores health to the patient, but also eradicates the primary cause of his disability.

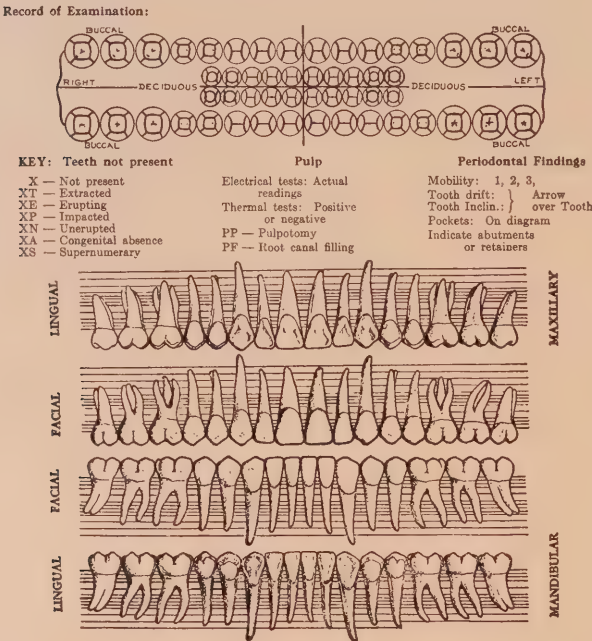
There is no simple alphabet by which we can learn how to reach a specific diagnosis. All that is possible is to be

meticulous in our collection of information, select from that information those facts which seem important, and then by a logical process of deduction, arrive at the diagnosis. Knowledge of signs and symptoms is a prerequisite, but the constant repetition of diagnostic method will provide the practice which becomes experience, and which is so vital to skilled diagnosis.

PROGNOSIS

Having reached a diagnosis, it should be possible to forecast, with some degree of certainty, the probable course and the approximate duration of the disease, as well as the likely result of treatment.

FIGURE 2 Specimen chart for recording clinical observations.



The patient should be warned about the consequence of allowing the disease to progress untreated. If the aetiological factor cannot be determined (as for example in periodontosis), this, too, should be explained since these patients are liable to have recurrent episodes of periodontal disease.

In patients where the periodontal condition would appear to stem from a systemic factor, the outlook is less favourable, since local factors generally are much more easily controlled. Certain disease processes, encountered in the periodontium, such as chronic marginal gingivitis, can be reversed. If the aetiological factor can be identified in these cases the prognosis is excellent. Pocket depth must be considered when the dentist is endeavouring to predict the outcome of conditions, such as chronic periodontitis. The prognosis here would be influenced, too, by the number of teeth present, the position of such teeth in the arch, and their relationships, one to the other.

An over-all observation would be that the patient's attitude is of immeasurable importance when making a prognosis. In periodontics the most remediable condition may have a poor outcome if the patient's co-operation in oral hygiene, etc., cannot be obtained. In those circumstances, however, it may be found that the patient does not have a full understanding of what is to be gained by periodontal treatment. There should be no mistaken idea that treatment or lack of it means only the retention or loss of two teeth, for instance. It should be made clear to the patient that, while it is regrettable to lose teeth, this is not the main point at issue. Periodontal disease is a true disease, and, as such, may spread to adjacent teeth and influence the function of the rest of the dentition. As the area of infection in the oral cavity increases, so does a source of potential danger to the system. It is the duty of the dentist to make the situation clear to his patient, and advise as to the need for treatment. If, despite this, the patient

still shows reluctance, however, it is questionable whether treatment would be of any lasting value. The inefficient practice of oral hygiene by the patient could well induce a return of the original condition. Inevitably, this results in the dentist being considered inadequate, rather than the patient unco-operative.

If the patient is anxious for treatment, however, the plan formulated by the dentist should be explained in detail. It is axiomatic that this plan be devised with due regard for the diagnosis and prognosis.

TREATMENT PLANNING

The first step in any such treatment plan obviously would be the relief of acute pain, if any. Such pain could be caused by acute abscesses, for example, or by acute ulcerative gingivitis of the Vincent's type.

Any area of sepsis should be attended to next. Treatment here would consist of scaling and prophylaxis, preceded by forceful irrigation, using a 3 per cent solution of hydrogen peroxide, diluted by half with warm water. Instruction should be given at this time in correct oral hygiene techniques. Where there is need for emergency operative dental procedures, these should be carried out as soon as possible. Due caution should be exercised, however, before any extractions are performed. The value of each individual tooth in relation to the mouth as a whole must not be overlooked. The potential value of a tooth as an abutment for a future bridge or partial denture should always be considered.

This should be followed by pocket eradication which should be carried out by one of the several methods at our disposal. In some cases, where the aetiological factor is considered to be occlusal trauma, a preliminary occlusal equilibration should be carried out prior to pocket elimination.

In normal circumstances occlusal correction, where necessary, should be per-

formed at this stage. Restorative procedures should be completed in such a fashion as to conform to the new pattern of occlusion. An immediate re-examination of the occlusion, with a view to further correction, should then be made.

No treatment should be considered complete until arrangements have been made for recall of patient.

Finally, it should be said that the best treatment in periodontal disease is the early treatment. This is not only more often successful, but also preferable from the patient's point of view, since it is comparatively painless and also inexpensive.

RÉSUMÉ

L'auteur décrit les observations qu'il faut faire, l'importance d'établir une histoire de cas et la façon d'examiner un patient qui souffre de périodontoclasie avant d'en arriver à un diagnostic et à un plan de traitement.

Une histoire de cas complète comprend des renseignements sur la nature et la durée des lésions principales, sur les autres désordres dentaires, sur les traitements antécédents de périodontie et sur la présence de maladies constitutionnelles qui pourraient avoir un effet sur l'état actuel.

L'examen commence par l'arcade dentaire. L'intérieur des joues, les lèvres, la langue et la muqueuse buccale dans son ensemble sont scrutés avec soin. On doit faire une revue de toutes les restaurations. Il faut examiner l'articulation mandibulaire et déceler tous les ganglions lymphatiques qui peuvent se trouver dans les environs de la cavité buccale.

Ensuite, il faut porter l'attention vers les dents pour noter leur position, leur mobilité, leur degré de fonctionnement et la présence de calculs.

Les tissus gingivaux sont examinés pour les caractéristiques suivantes: tonus, contour, texture, présence de clapiers, déchussement et insertions musculaires élevées.

L'examen radiologique ne peut se substituer à un examen clinique qui doit comprendre une histoire de cas détaillée et systématique. Les radiographies constituent un dossier utile qui illustre l'état du patient avant et après les traitements; elle sert aussi à situer le niveau de l'os alvéolaire dans les cas de périodontite chronique et à évaluer la lyse osseuse qui s'est produite au cours de la maladie.

Il faut parfois, pour établir un diagnostic définitif, confectionner des modèles d'étude et prélever des cultures ou des frottis bactériologiques.

Le pronostic s'établit sur les constatations pathologiques et sur l'attitude du patient en face des traitements.

La première phase consiste dans le soulagement de la douleur; ensuite, il faut s'occuper des endroits où il y a de l'infection et donner des conseils au patient au sujet de son hygiène buccale. Plus tard, il faut éliminer les clapiers. Dans certains cas, quand l'occlusion traumatique entre dans l'étiologie de la maladie, il faut procéder à l'équilibration de l'occlusion avant d'éliminer les clapiers.

Plus tôt le traitement est institué, meilleur il est; ses chances de succès sont non seulement plus grandes, mais aussi le patient l'accepte mieux, car il est indolore et il ne coûte pas cher.

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Occlusal correction

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The science of articulating teeth is one of the most important sciences in the practice of dentistry. The oral health, the general health, the welfare and happiness of our patients throughout their lives is very materially influenced by our knowledge and understanding of tooth relation.¹ It involves every phase of dentistry: preventive dentistry, orthodontics, the restoration of teeth by fillings, crowns, fixed bridges, removable partial dentures and full dentures.

The general practitioner, the orthodontist, the periodontist, the radiologist, the oral surgeon, and the prosthodontist must consider the effects of occlusal abnormalities or disharmonies upon facial expression, oral function, oral pathology, premature loss of teeth, injury to the temporomandibular joint, pain or spasm of the muscles of mastication and other irregularities.

Correcting the occlusion for the release of stress in the temporomandibular joint and related structures is perhaps the newest treatment used by dentists, and one of the most valuable. This discussion is intended to bring the general concept into sharper focus.

Although the correction of occlusal disharmonies by means of selective grinding is a useful technique, its limitations must be recognized. Orthodontic movement and/or occlusal reconstruction are often required to achieve the desired result.

The objective of occlusal correction is to re-establish a functional occlusion which will be in harmony with the temporomandibular joint and associated musculature and which will enable the

periodontal tissues to maintain physiological equilibrium. To achieve this, the forces of occlusion are distributed over the maximum number of teeth in centric occlusion.

When a patient's history reveals that a habit may be contributing to the existing problem, every effort should be made to correct it.

Occlusal correction in this paper will deal mainly with the detection and removal of premature contacts in centric relation in the natural dentition. Centric relation is the relation of the mandible to the cranium and is defined as the most retruded position of the mandible in relation to the maxilla when both condyles are in the most posterior unstrained position in the glenoid fossae from which lateral movements can be made.

Centric occlusion is the position of the teeth, with the jaws closed and the teeth at maximum intercuspation, with the mandible in its centric relation.

Habitual, acquired, static or convenience occlusion is the same as centric occlusion except that the mandible is not in centric relation.

Stillman and McCall define traumatic occlusion as an abnormal occlusal stress which is capable of producing or has produced injury to the periodontal tissues.² (Injury to the temporomandibular joint and associated musculature must also be considered.) Box described three types of traumatic occlusion: (1) Primary type.—In this case there is an abnormal occlusal factor with a normal periodontal factor. The magnitude of the force delivered in either a vertical or a horizontal direction exceeds the adaptive capacity of the supporting tissues. Pernicious habits, premature contacts in centric occlusion and the

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functional movements, and an over-developed musculature, are some of the more common examples. (2) Secondary type.—Here the occlusal factor is normal but the periodontal factor is abnormal. Because disease has produced loss of the supporting tissues or where an unfavourable crown-to-root ratio exists due to large bell-shaped crowns and short conical or fused roots, the periodontium is unable to adapt to normal functional forces. (3) Combined type.—Here the occlusal factor and periodontal factor are both abnormal. It is with occlusal correction that we try to establish occlusal equilibrium and prevent trauma.

One of the main objectives of occlusal adjustment is to create a harmony of centric relation and centric occlusion.³ Study casts mounted on an adjustable instrument are useful for diagnosis.

A disharmony between centric occlusion and centric relation frequently exists when teeth have been badly worn, or the arches are otherwise mutilated.¹ Therefore casts should never be related in the hand because of the probability of occluding the teeth in the acquired occlusion. They must be related by the use of carefully obtained intraoral centric relation records. To obtain this intraoral centric relation record, the patient should first be coached to relax his jaw and be able to close in centric relation occlusion repeatedly.

The patient is seated comfortably in the dental chair in an upright position. The head and trunk of the body are erect without strain. The chair is adjusted so that the patient cannot slump. The arms are placed on the arm rests and the feet on the foot rest. The legs should not be crossed, to avoid curvature in the skeletal structure.

Now with the thumb on the patient's chin and the index finger under the chin the dentist induces the patient to relax his jaw until it will move freely with no muscular tension. The jaw usually goes back and can be jigged gently up and down until the mandibular teeth contact the maxillary teeth. The patient will tell

at this point which side is making contact, and in fact which tooth is involved if only one is touching. It is important to repeat this exercise and get the patient to do it alone so that he can repeat this relaxed centric relation "not closing to complete closure" but stopping at the initial contact. The dentist should note the position of one of the maxillary teeth in relation to one of the mandibular teeth at this point as a landmark. Thus, when the intraoral registration is made, one can be sure that the mandible is in the proper centric relation position.

It is sometimes advisable to have the patient close from first contact to complete closure to show him what not to do when making the centric relation registration.

It is also preferable to avoid words such as "bite" or "close" and rather use expressions such as "relax" and "sensitive feel of teeth" when coaching the patient.

The registration is made preferably with a non-resistant material which will retain a rigid form for the mounting of casts. Examples are plaster of Paris, zinc oxide pastes, and alginate materials. Wax is also used, but it provides a bit of resistance and flexibility in mounting which could cause inaccuracy. The accuracy of mounting casts should be proved by obtaining additional centric relation records for checking purposes. Only accurate centric relation records can be exactly duplicated. The casts are now mounted on an articulator in centric relation. The dentist can now decide whether treatment can be done by occlusal correction by grinding, or whether some other form of treatment such as orthodontic therapy or reconstruction or a combination of these is necessary.

The changes that take place in the adult dentition consist of attrition and of migration of the teeth, both occlusally and mesially. A single examination provides but a cross section, a momentary picture of a lengthy process. Knowledge of the changes that various types of adult dentitions undergo is of importance then in evaluating the "momentary" occlusion for

treatment planning and for prognosis of occlusal correction.

In the correction of occlusal disharmony, we must visualize definite objectives. In centric occlusion, there should be no anterior or lateral shift of the mandible from centric relation after the initial contact is made.⁴ Centric occlusion and centric relation should correspond. The tips of mandibular buccal cusps should contact the maxillary marginal ridges. The tips of maxillary lingual cusps should contact the mandibular marginal ridges and fossae. The meeting points should be point contact, not flat surfaces. For example, if the lingual cusp of the maxillary second molar is in complete contact with the fossa of the mandibular second molar, the maxillary lingual cusp should be recontoured until just the tip of the cusp contacts the centre of the fossa. The dentist must check where the cusps contact the opposing tooth, because he can determine where the final contact is to be by the way he contours the cusp. Ideally, we want to avoid contact on inclined planes except the lingual surface of maxillary incisors. The force of occlusion should be directed through the long axis of the tooth, eliminating lateral stresses. At the same time it is important to retain the maxillo-mandibular distance.

PROCEDURE

Before grinding any tooth, one should consider its relationship in centric occlusion and in all functional movements. The decision of where to grind a tooth is always made in the mouth. Study models carefully mounted on an articulator are essential for diagnosis but must not be relied upon for deciding exactly where to grind.

Premature Contacts in Centric Occlusion.

—Centric premature contacts are detected by visual observation of tooth movement or mandibular displacement, palpation, registration with wax and articulat-

ing paper, and from the patient's observations. Either (1) the tooth or teeth making premature contact become loose and move out of position until firm holding contacts are engaged or (2) a mandibular shift or slide occurs to an eccentric position. A combination of these factors is frequently encountered.

The following rules may be applied for correction of centric premature contacts.²

1. Anterior Teeth.—If the lower incisors contact prematurely in centric and protrusive position, we grind the incisal edge of the lower teeth. If the premature contact is in centric occlusion only, we grind the palatal aspect of the upper teeth.

2. Posterior Teeth.—If the buccal cusps of the lower posterior teeth contact prematurely in centric occlusion and the lateral working position, we grind these cusps. If the buccal cusps of the lower teeth are in premature contact in centric occlusion alone, we grind the fossae of the upper teeth. If the premature contact is on the mesial and distal guiding inclines, we grind the distal inclines of the upper teeth and the mesial inclines of the lower teeth.

Premature Contacts on Mobile Teeth.—

First consideration must be given to eliminating the premature contacts on mobile teeth. Many teeth are too loose to perforate wax or mark articulating paper, so that the first contact or perforation will be made by those teeth which are firm. This may mislead the dentist into grinding the wrong teeth. Loose teeth are adjusted in the following manner:

1. The patient is again coached to close the teeth in centric occlusion. While the patient holds the teeth lightly together, the dentist holding the chin with his thumb and forefinger can tap the teeth together. No attempt should be made to force the mandible into a retruded position. By passing the fingers of the other hand lightly over the teeth and observing the teeth at the gingival line while the patient closes, the dentist can deter-

mine which teeth are mobile and the direction in which they are being displaced.

2. We adjust one tooth at a time.

3. Using either articulating wax, or articulating paper, typewriter ribbon or dye, the patient is asked to tap rapidly in centric occlusion while the tooth is being supported. If the tooth is being displaced buccally or labially, it can be supported by firm finger pressure. If the tooth is being displaced mesially or distally, it is supported with an instrument. If the displacement is lingual, the tooth can be supported with a loop of dental floss and pulled to the buccal or labial aspect.

4. The points of premature contact should show clearly and should not be mistaken for smudges. The tooth surfaces are now reduced according to the rules given previously. The marking and reduction is repeated until the dentist can no longer see or feel the tooth being displaced.

5. Teeth which are being depressed can be supported by pulling down with a sharp instrument engaging the tooth at the cervical line. The tooth should be relieved until it is slightly out of occlusion.

6. When most of the teeth are mobile and there are insufficient firm holding contacts in centric occlusion, the teeth must be supported with some form of temporary splinting.

7. When a passive occlusion in centric relation has been established on all of the loose teeth, the patient should be dismissed and the next visit deferred for at least one week. When the patient returns the dentist will find that the mobility of the teeth has decreased, but that one or more of the teeth are again making premature contact. This does not represent failure, but rather an attempt by those teeth which have been displaced to reposition themselves. The procedure of the previous visit is again repeated until the teeth are once more in passive occlusion.

Premature Contacts on Firm Teeth with Mandibular Displacement. — The next step in correcting centric occlusion is

again accomplished with either articulating wax or paper, typewriter ribbon or dye. From this point on the treatment for mobile teeth, and the treatment for firm teeth and mandibular displacement is the same.

The patient is asked to close in centric occlusion or gently guided to that position until the first contact is felt. He will then point to the side or the tooth which touched first without moving his jaw. This procedure is repeated using the articulating indicator of choice and the point of premature contact will show clearly. This is now ground on the upper or lower teeth as previously outlined. As this procedure is repeated, it will be noted that points of first contact increase in number. If the patient can now squeeze the jaws together tightly without a shift or slide of the mandible, and if his teeth occlude with a sharp snap, we have established the harmony between centric occlusion and centric relation which was one of the main objectives. The patient should again be dismissed and the next visit deferred for at least one week.

The next step is to stabilize the new found centric occlusion by having the tips of the mandibular buccal cusps contact the maxillary marginal ridges and the tips of the maxillary lingual cusps contact the mandibular marginal ridges and fossae. Ideally, we want to avoid contact on inclined planes except on the lingual surfaces of the maxillary anterior teeth.

This procedure should be done using wax and articulating paper until as many ideal centric contact points as possible can be established, always having the force of occlusion directed through the long axis of the tooth and eliminating lateral stresses.

Once centric occlusion has been established, this relationship must not be disturbed by the succeeding steps in occlusal correction.

There are two schools of thought regarding the correction of right and left lateral excursions. One viewpoint is that the labial surface of the mandibular cuspid should slide over the lingual surface

of the maxillary cuspid, lifting all other teeth out of contact, both on the functioning side and the balancing side. If the cuspids are not in position to, or are not qualified to do this, the next best alternative is to create an even posterior group function with no balancing interference. If the degree of incline of the functioning cusps is not sufficient to lift the balancing posterior cusps out of contact, then an even group balancing is desirable. There should be no contact of the central or lateral incisors in lateral movements. There are conditions where posterior group function would be preferred to the cuspid rise. The other viewpoint is to have free multi-directional movement with no cuspid interference. Both theories agree that there should be no contact on the balancing side.⁵

In protrusive excursion contact should be distributed evenly over all anterior teeth with no posterior interference except for the mesial marginal ridge of the mandibular first bicuspid. Reduction to create this should be from the lingual aspect of the maxillary anterior teeth unless there is an anterior premature contact in centric occlusion. Reduction should then be effected from the incisal edge of the mandibular anterior teeth. This should have been already done during adjustment for centric occlusion, but after posterior adjustment further adjustment may again be necessary.

Certain supplementary adjustments may be made when centric occlusion has been satisfactorily established. These include correction of the occlusal plane, correction of factors causing food impaction, and reshaping abnormally worn teeth. When making these supplementary adjustments care must be exercised to avoid altering centric occlusion.

Correction of the Occlusal Plane.—Anterior teeth should be reshaped for an improved aesthetic result and for the reduction of leverage. Extruded or malposed teeth should also be reshaped or reduced to the original plane of occlusion. This phase of equilibration is a very important

prerequisite to the restoration of the occlusion with prosthetic replacements.²

Correction of Causes of Food Impaction.

—The elimination of plunger cusps, equalizing of marginal ridges and the correction of occlusal anatomy with escape sluiceways is an important step in correcting causes of food impaction. Tooth mobility also promotes food impaction and the problem may persist until the centric and working bite premature occlusal contacts have been corrected and the teeth hold firmly while in function.

Reshaping Abnormally Worn Teeth.—

The reduction of bucco-lingual width, restoration of anatomical form in harmony with the age and periodontal resistance, reshaping the sharp corners of the anterior teeth and the reduction of wear facets will improve the masticatory efficiency and reduce the forces of occlusion on individual teeth. The buccal cusps of the lower bicuspid and molars may exhibit considerable wear, while the lingual cusps are relatively unworn. These lingual cusps may be radically reduced and reshaped to the original width of the tooth without affecting centric occlusion. The lingual inclination of these teeth together with a high unworn cusp tends to direct the forces of occlusion unfavorably during tooth-to-tooth contact or through the bolus of food.

INDICATIONS FOR OCCLUSAL CORRECTION

This procedure warrants consideration in the following circumstances:

1. Mobile teeth
2. Patients with periodontal disease
3. Temporomandibular joint disturbances. Occlusal adjustment has an application in four specific types of temporomandibular joint disturbance:

(a) Pain occurring during terminal closure into occlusion.—Response to occlusal adjustment is often rapid, but may require several adjustments at intervals.⁶

(b) Restricted opening.—Response to occlusal adjustment is often evident a few moments after termination of the initial adjustment. Further adjustment is indicated until a stable occlusion is maintained. Occlusal deflection is often the direct cause of muscle spasm, and stabilization of the occlusion in centric relation is the most direct approach to the relaxation of the muscle since it eliminates the trigger that initiates the spasm.

(c) Clicking occurring during terminal closure into occlusion.—One theory is that the clicking is caused by disk-condyle slippage producing the snapping sound. Occlusal adjustment is often effective in relieving or eliminating the sound. Marked improvement may take several months, with further adjustment required at intervals.

(d) Crepitus.—The annoying sounds (like stepping on shale) and roughness of movement often decrease slowly when a stable occlusion is attained by occlusal adjustment. This usually takes months. Crepitus responds more rapidly to direct injection of the joint with hyaluronidase. Occlusal adjustment might well be used in conjunction with this procedure.

4. Muscle spasm

5. Teeth with facets exhibiting signs of gross wear

6. Teeth that are hypersensitive to thermal stimuli

To a very great extent the temporomandibular joint is the direct responsibility of the dental profession, and fortunately more and more dentists are accepting that responsibility. Moreover, the necessity for consultation in the diagnosis and treatment of temporomandibular joint disturbances brings the dentist and the physician closer together.⁷ This is a gratifying development.

justment and the whole field of temporomandibular joint therapy. General practitioners who prefer to refer a patient for periodontal treatment should at least be sufficiently well informed about these matters in order to provide appropriate treatment for their patients.

RÉSUMÉ

On corrige l'occlusion pour rétablir la fonction de l'articulé de façon à ce qu'il s'harmonise avec la physiologie de l'articulation mandibulaire et de sa musculature et qu'il permette aux tissus périodentaires de conserver leur état normal. Ce phénomène d'équilibre s'établit quand les pressions musculaires se répartissent, en occlusion centrique, sur le plus grand nombre de dents possible.

La correction d'occlusion, selon la définition de l'auteur, se résume à déceler et à éliminer les contacts prématurés de la denture naturelle en occlusion centrique.

La relation centrique est celle de la mandibule avec le crâne. Elle se situe dans la position la plus reculée de la mandibule en rapport avec le maxillaire quand les condyles, sans tension, sont au fond de la cavité glénoïde et quand des mouvements latéraux sont encore possibles. L'occlusion centrique se réalise quand les dents des deux maxillaires, à la fermeture de la mandibule en relation centrique, établissent entre elles les contacts les plus étendus.

Le but principal de l'équilibration d'occlusion est de marier la relation centrique avec l'occlusion centrique.

Des modèles d'étude montés sur un articulateur mobile sont utiles à un diagnostic; ces modèles doivent être placés sur l'articulateur en relation centrique exacte, à l'aide de données précises enregistrées dans la cavité buccale. Cet enregistrement se fait de préférence avec un matériel non-résistant qui garde sa rigidité et qui facilite la mise en place des modèles, par exemple, le plâtre, les

CONCLUSION

It behooves all dentists to give their patients the benefit of recent advances in knowledge concerning occlusal ad-

pâtes d'oxyde de zinc ou les alginates. On peut employer la cire, mais sa résistance et sa flexibilité peuvent être un obstacle à l'exactitude des relations des modèles, l'un avec l'autre.

Dans l'occlusion centrique, la mandibule ne devrait pas se déplacer en avant ou sur les côtés, une fois que le contact s'est établi d'après la relation centrique. L'occlusion et la relation centrique devraient se superposer. Le bout des cuspidés des dents inférieures devrait venir en contact avec les crêtes marginales des dents supérieures; le bout des cuspes linguales des dents supérieures en contact avec les crêtes et les dépressions marginales des dents inférieures. Les points de rencontre devraient être les points de contact et non les surfaces plates. La situation idéale serait d'éviter le contact des plans inclinés excepté aux surfaces linguales des incisives supérieures. Les forces d'occlusion devraient s'établir, autant que possible, en direction du grand axe de la dent pour éviter les pressions latérales. Il est important aussi de maintenir la distance maxillo-mandibulaire.

Il est bon, avant de meuler une dent, de songer à son rôle dans l'occlusion centrique et dans tous les mouvements qu'exécute la mandibule. Ce n'est que dans la bouche qu'il est possible de déterminer quelle dent a besoin d'être meulée.

Des modèles d'étude montés avec précision sur l'articulateur sont utiles à un diagnostic, mais on ne peut pas se fier à des modèles pour fixer l'endroit où doit se faire le meulage.

On commence par corriger les contacts prématurés en occlusion centrique, ensuite les contacts prématurés sur les dents

mobiles, enfin les contacts prématurés sur les dents solides au cours des mouvements de circumduction. Il faut parfois compléter l'équilibration quand l'occlusion centrique a été rétablie; ces retouches visent l'élaboration d'un plan occlusal, l'élimination des facteurs qui favorisent la rétention des aliments et la restitution de formes normales à des dents usées.

Les corrections occlusales sont destinées aux patients qui souffrent de maladies périodentaires, à ceux qui ont des dents hypersensibles au froid ou au chaud, des dents branlantes, des dents dont certaines faces montrent des signes d'abrasion, à ceux qui se plaignent de spasmes musculaires ou de certaines dysfonctions temporo-mandibulaires. Parmi celles-ci, il faut noter la douleur qui se manifeste au cours de la dernière phase de la fermeture des dents en occlusion, la gêne éprouvée à l'ouverture de la bouche, les craquements et les crépitements dans l'articulation.

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Surgical management of periodontal pockets

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It is a well-known fact that the periodontal pocket is a self deepening lesion. The mere presence of a deepened gingival sulcus will bring about an increase of the bacterial flora of the sulcus and an increased deposition of calculus. These factors soon produce an ulceration of the epithelial lining of the pocket, a destruction of the gingival group of fibres of the periodontal ligament, and eventually a loss of the alveolar bone. As the pocket becomes deeper the bacterial flora and calculus formation increase leading to greater destruction of the periodontal tissue. If the disease process is to be stopped it is imperative that the sulcus depth be reduced to zero or at least to an absolute minimum. No matter how great an improvement in tissue tone and appearance is obtained through initial therapy, scaling and curettage, the conditions cannot be considered to be cured or treatment completed as long as the sulcus depth has not been reduced to an acceptable minimum.

In the last ten years there has been a tremendous improvement and refinement in surgical techniques. We no longer think of these procedures as being "radical" because it is now understood that they can result in perfect gingival health, maximum bone regeneration and minimum sulcus depth. This should be the goal of periodontal treatment, regardless of the technique or approach selected.

In time we will undoubtedly learn that some of our newer techniques are needlessly involved and possibly too radical. However the "conservation" of the pockets would be a much greater evil than

the unnecessary loss of some supporting tissue through a surgical operation which would result in the permanent healing of the periodontal tissues.

In this paper we will first review the different surgical techniques. Then we will discuss their application to patients where pocket elimination presents special problems.

PRESURGICAL SCALING AND SUBGINGIVAL CURETTAGE

Scaling and curettage are not generally considered as being part of periodontal surgery proper.^{1,2} The main objective in performing these operations is the removal of the causative agent, namely calculus, and the reduction of the bacterial flora of the pocket. This should be part of the initial preparation of the patient before surgical procedures are attempted, both for aesthetic reasons and because the gingival tissues do not have an abnormal tendency to bleed.

Many dentists consider that healing will be more favourable and that the danger of infection will be lessened if a careful scaling is performed prior to surgical operations in the mouth.

True subgingival curettage should not be confused with subgingival scaling. The former is a more elaborate operation the objective of which includes not only the removal of all calculus but also the removal of the epithelial lining of the pocket.

Shallow pockets will often be eliminated through tissue shrinkage as a result of scaling and subgingival curettage. In addition much radiographic evidence has been published to support claims of bone regeneration and pocket closure in

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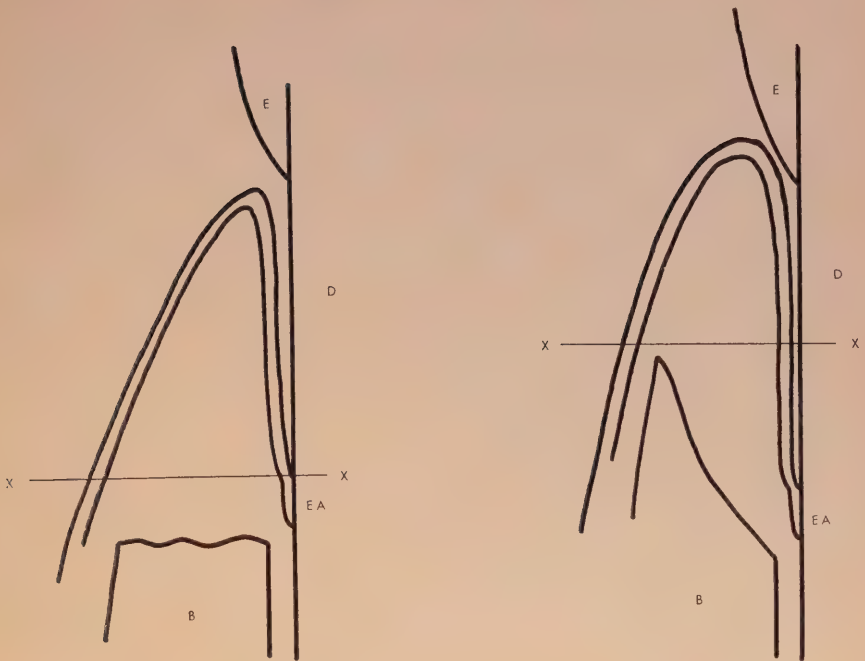


FIGURE 1 Left: Gingival pocket. An incision at X-X will eliminate the pocket entirely. Right: Infra-bony pocket. An incision at the bone level X-X will eliminate only part of the pocket. E, Enamel; D, Dentine; B, Bone; EA, Epithelial attachment.

cases of deep pockets treated by subgingival curettage.

This technique, however, seems to bring better results in the hands of some dentists endowed with exceptional manual dexterity than it does for the average practitioner who will feel that an excessive amount of time and patience is needed to treat a deep pocket successfully through subgingival curettage alone.

In all cases where scaling and curettage are selected as the treatment of choice it is extremely important to re-evaluate the patient's condition after healing has taken place. Should pocket depth greater than a few millimetres still be present, a re-

currence of the symptoms and an increase in depth of these pockets is likely to occur in a relatively short time. Some other form of periodontal surgery would be indicated to eliminate the excessive sulcus depth and would be much preferable to "conservation" of the pocket.

GINGIVECTOMY

Gingivectomy is the oldest surgical technique in periodontics. Most of the newer surgical techniques merely represent modifications and refinements of gingivectomy.^{3,4}

The objective of this operation is to produce gingival recession through the surgical removal of the outer pocket wall. Healing will take place at a more apical level, the gingival margin will be repositioned close to the level of the remaining alveolar bone and a normal sulcus depth will result.

The removal of the outer pocket wall will also expose the roots of the teeth and greatly facilitate the removal of calculus which is otherwise inaccessible (Figure 1 left).

It is important to realize that no supporting tissue whatsoever is lost as a result of gingivectomy. The outer pocket wall which is removed had lost its supporting function as a result of the disease long before excision. Even though the gingival group of fibres of the periodontal ligament are often removed during gingivectomy these dense collagen fibres will regenerate very readily once the pocket and the local irritants are eliminated. They will contribute materially to the stability of the teeth.

During gingivectomy the soft tissues are easily contoured and carved either with scalpels or with rotary instruments in order to obtain an acceptable physiological form and eliminate thick gingival borders or festoons, interproximal soft tissue craters and inconsistent gingival margins. Proper physiological form or architecture greatly facilitate the maintenance of the tissue through adequate postoperative oral hygiene.

To obtain best results with gingivectomy it is necessary that the muco-buccal fold be of such depth that the gingival margin will not be located too close to the base of the vestibular trough following the operation. If all of the attached gingiva is removed, gingivectomy will have to be supplemented with other forms of periodontal surgery which we will discuss later.

Gingivectomy will also yield its best clinical results in cases where the bone resorption follows an even horizontal pattern or where pocket formation is the result of gingival enlargement with little

or no disturbance of the alveolar margin and of the epithelial attachment.

Frequently, however, the pattern of bone resorption is very uneven, pocket depth being considerable around one tooth and negligible on the adjacent teeth. In other instances part of the pocket wall consists of bone.

In such cases it is obviously impossible to obtain satisfactory therapeutic results by the resection of soft tissue alone and some procedure must be performed to correct the bony deformities (Figure 1 right).

OSSEOUS SURGERY

Osseous surgery consists either of osteoplasty where bone of the alveolar process is reshaped through the removal of small quantities of bone, or osteectomy where larger amounts of that bone which directly supports the tooth has to be sacrificed in order to obtain the desired architecture.⁵⁻⁸

Ideally the shape of the edge of the alveolar process bone should resemble the form of the healthy gingiva. The margin should be slightly more coronal in the interproximal space than on the buccal or lingual plate. It should also be very thin and festooned at a consistent level.

Periodontal disease will often produce a very uneven pattern of bone resorption. We find ourselves confronted with abnormal bony architecture. We will want to change this architecture, sometimes radically, to bring it closer to the ideal bone form over which the gingiva can heal to a physiological shape consistent with easy maintenance.

Radiographic examination will reveal the gross irregularities in bony contour. Careful probing of the pockets will lead the dentist to suspect more bony deformities. However, it is only through direct observation and exploration of the bone itself, during the surgical procedure that we can gain an accurate idea of the actual pattern of the bone edge.

One commonly used approach to osseous surgery is gingivectomy used either

alone or in combination with a "semi-flap." A gingivectomy is first performed throughout the entire area selected for operation. After the overlying soft tissue is removed the bone topography is studied to determine the extent of the osseous excision that will be done.

If only a slight correction is needed the bone contour can be corrected while the soft tissues are being reshaped with the rotary instruments. The proper contour is simply carved into the soft tissues and the bone without distinction. Whatever bone is left without soft tissue covering will be protected by the surgical dressing and granulation will take place readily.

Should a more elaborate osteoectomy be necessary it is usually preferable to reflect the soft tissues to avoid excessive damage. A semi-flap without vertical incision is lifted using a periosteal elevator. The bone is contoured with rotary instruments under a spray or with chisels and curettes.

The reflected soft tissues are then re-adapted prior to the placement of the surgical dressing.

THE FLAP OPERATION

The flap operation or flap approach is a most useful technique, which permits the accurate visualization of the involved area to an extent impossible with any other technique.

A flap operation is not indicated in cases that can be adequately treated by gingivectomy in the absence of bone deformities. In such cases better tissue contouring is usually possible through gingivectomy with less disturbance of the attachment apparatus and an easier post-operative course.

However, in cases of deep or complex bone irregularities a full flap is easily laid back by doing a vertical incision mesially to the site of operation, severing the interproximal tissues with a sharp knife and reflecting all the soft tissues with a periosteal elevator. After the re-

maining calculus and the soft tissue contents of the pockets have been curetted out the bony lesions can be observed readily and a decision can be made as to the best way of obtaining proper architecture.

The bone is recontoured with stones or chisel. Any special therapeutic problem can be taken care of at this time before the flap is re-adapted, contoured and sutured.

The successful outcome of the flap operation depends not only on the proper performance of osteoectomy or osteoplasty but also on the proper handling of the soft tissue flap after these operations have been performed.

Should the flap be re-adapted without special precautions or trimming, it will heal only to form the soft tissue wall of new pockets which will have to be eliminated later in a "second stage" gingivectomy.

After osteoectomy the flap should be re-adapted to the newly contoured bone and only enough soft tissue to cover the bone should be preserved. Some dentists prefer to leave the flap about one-half millimetre short thus leaving a very small amount of bone exposed to be covered by newly formed granulation tissue.

If the flap consists of thick fibrous tissue it should also be thinned by removing some connective tissue from the "inside" surface.

Proper festooning of the flap is highly desirable. The shape of the soft tissue should follow very closely the contour of the bone making sure that the flap has no excessive length that would form a soft tissue wall for a new pocket. Whenever possible a point or triangle of tissue is preserved to protect the interproximal space thus reducing to a minimum the amount of bone to be covered by granulation tissue.

The buccal and lingual flaps are sutured interproximally and a surgical dressing is applied over the entire area. In another instance a flap is laid back on the buccal aspect where most of the bone

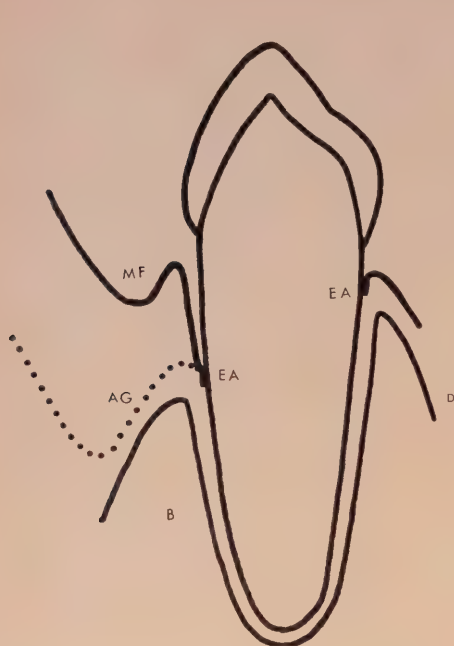


FIGURE 2 Buccal pocket extending below the level of the muco-buccal fold, MF. Pocket elimination is possible only through muco-buccal surgery. Muco-buccal fold extension should be done according to the dotted line, creating a new zone of attached gingiva, AG. B, Bone; EA, Epithelial attachment.

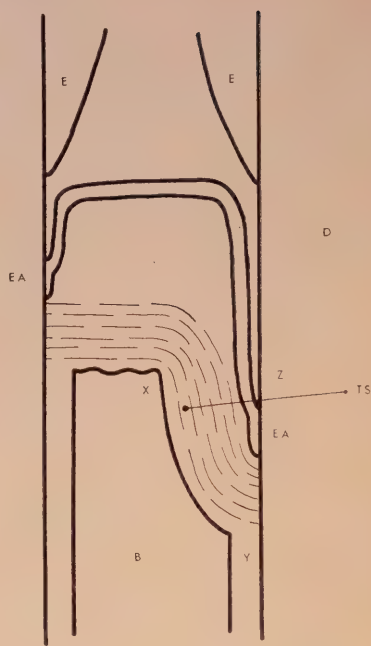


FIGURE 3 Infrabony pocket. Trans-septal fibres TS have to be removed if bone formation is to be expected in the area X Y Z. E, Enamel; D, Dentine; B, Bone; EA, Epithelial attachment.

deformities are located (if such is the case) while a gingivectomy is performed on the lingual aspect where the bone is more even. In such a case the buccal flap is sutured to the palatal or lingual mucosa.

MUCOGINGIVAL SURGERY

As a result of gingivectomy or as a result of pathological recession it is sometimes found that most of the attached gingiva has been eliminated or destroyed. In such cases the gingival

margin is situated in the neighbourhood of the alveolar mucosa. Proper gingival health is almost impossible unless the situation is corrected because the muscles of the lip or the cheek constantly pull the gingival margin away from the tooth causing food impaction in the sulcus and similar local irritations. Proper oral hygiene and gingival massage would also be very difficult.⁹⁻¹¹

It is to overcome these difficulties that the techniques of mucogingival surgery have been developed. The aim of these

techniques is the improvement of the relations of the gingival margin, the attached gingiva and the alveolar mucosa usually by deepening the muco-buccal fold and creating an increased zone of attached gingiva (Figure 2). Fraena which are situated at an abnormal height incisally or too close to a receded gingival margin present a very frequent indication for mucogingival surgery. The fraenum is dissected and the muco-buccal fold is deepened after gingivectomy has been performed to take care of the marginal problems.

It is extremely important to recognize the limitations imposed on mucogingival surgery by anatomical features such as the external oblique ridge. These techniques are relatively recent and much remains to be learned about the manner in which unusual problems have to be handled. However, mucogingival surgery remains a technique which is extremely useful and entirely reliable when properly used.

SPECIAL PROBLEMS

Each patient with periodontal disease requiring surgical treatment will present some special variations and the alert dentist will be quick in adapting the classic techniques to the individual needs of the case at hand.

There are, however, some variations of the ordinary techniques which have become standardized. These are described in the following paragraphs.

The Periodontal Abscess. — It is important to realize that the periodontal abscess is nothing but an episode of acute infection evolved from the chronic infection usually found in a periodontal pocket of some depth.

Very often the acute episode of infection will result from lowering of the general resistance of the patient. It can be the result of lack of sleep, overwork, tension and similar factors. It can also accompany an infection taking place else-

where in the body, very often an infection of the upper respiratory tract.

In such a case the patient is no longer able to cope with the chronic infection occurring inside the periodontal pocket. The infection spreads into the deeper tissues giving rise to the acute symptoms.

A periodontal abscess can also be the result of incomplete treatment of a deep pocket, the initial scaling and accompanying laceration of the soft tissue wall being the trigger factors which initiate the acute phase of the infection.

If these considerations are kept in mind it is readily understood that the treatment of a periodontal abscess will consist of two separate steps. First, the infection must be brought under control. After the acute symptoms have subsided and the infection is again in a chronic state, the pocket must be eliminated by one of the appropriate techniques described earlier. This will ensure that the area will remain free from infection.

To bring the acute phase of the infection under control it is imperative to obtain drainage as soon as possible. A deep incision in the centre of the swelling very often will serve to obtain drainage of a large quantity of pus and blood.

Drainage should also be secured through the opening of the pocket. This is especially useful in the early stages of the evolution of the abscess when little or no pus has collected inside the swollen mass.

Cotton is rolled into small strips, two millimetres thick which are soaked with medicaments, usually the liquid from the surgical dressing. These cotton strips are small enough to be easily packed all the way down to the bottom of most pockets. In this way it is possible to stretch the outer wall of the pocket and establish free drainage through the natural opening of the pocket. The analgesic and anti-septic properties of the drugs used will be of some benefit while the cotton dressing will prevent the soft tissue from rubbing against the ever-present calculus.

At times antibiotics will be useful in the treatment of an acute periodontal in-

fection. These drugs should be used with care. Apart from a detailed discussion of the indication and contra-indications regarding the use of antibiotics in the treatment of periodontal disease, it may be said that these drugs should be reserved for the treatment of acute infections. They should seldom be used in the absence of an elevated temperature or of lymph gland involvement.

The Infrabony Pocket. — An infrabony pocket is a pocket which extends into the alveolar bone itself and where the base of the pocket has reached a position apical to the margin of the alveolar process. For an infrabony pocket to form the bone resorption has to be greater near the tooth than it is away from it. The wall of the pocket is not formed of soft tissue alone, but of bone as well.

This situation presents special therapeutic problems since resection of the soft tissue wall by gingivectomy eliminates only the most coronal part of the pocket leaving a sulcus much too deep to be acceptable.

By general agreement infrabony pockets are classified according to the number of osseous walls present.¹² One wall is always formed by the root surface of the involved tooth.

A narrow pocket extending into the mass of the bone of the alveolar process along the surface of the root will present three osseous walls. It actually is a hole created in the bone and it would closely resemble a tooth socket after extraction if it were not for the presence of the fourth wall formed by the root of the tooth.

Just as we expect a tooth socket to fill in with new bone, we expect the three-walled infrabony pocket to fill up with new bone coming from the three osseous walls of the lesion.

Obviously the healing of such a lesion will require the formation of a new portion of the periodontal ligament and some new attachment to the tooth. Experience has proven repeatedly that such a complex healing phenomenon is very

likely to take place resulting in the closure of the pocket and the filling in of the bony defect.¹²

To obtain closure of such a pocket calculus must be entirely removed from the root surface which must also be left smooth. The epithelial lining of the pocket and the epithelial attachment must be removed if bone is to fill in the defect.

The pocket will also contain a number of connective tissue fibres from the transeptal and gingival group of fibres of the periodontal ligament. These fibres are in a more or less degenerated state. They present a barrier to the formation of new attachment and must be removed if healing is to be successful (Figure 3).

It is extremely important to realize that the entire soft tissue content of the cavity in bone has to be removed if closure of the infrabony pocket is to be expected. Although some dentists feel that they can reach this objective by subgingival curettage, many believe that it is safer and faster to do a gingivectomy or to lay back a flap in order to gain better access to the infrabony pocket.

Infrabony pockets, having only one or two osseous walls, will not heal as readily as a three-walled pocket. Furthermore, the formation of new attachment is very unlikely to occur in such a wide and open lesion.

To eliminate the pocket completely it is necessary to remove the bony wall or walls by osteoectomy and then recontour the alveolar bone in order to give it a near normal shape at a more apical level. Only then can we expect the supporting tissues to heal with proper attachment and minimum sulcus depth (Figure 4).

Crater. — A bone deformity known as an interproximal crater develops when bone destruction is more rapid in the centre of the interproximal septum than at its buccal and lingual edges.

A crater can be considered as an infrabony pocket having four walls, two of which are osseous, the other two being formed by the root surfaces of two adjacent teeth. This lesion should be treated

FIGURE 4 One-wall infrabony pocket. Bone has to be resected along the dotted line if the pocket is to be eliminated. Very little actual supporting tissue is lost. B, Bone; E A, Epithelial attachment.

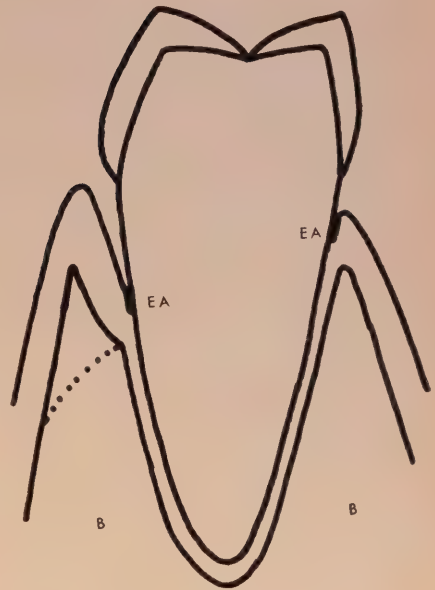


FIGURE 5 Interproximal crater. Left: Reshaping of bone is necessary on the buccal and lingual aspects. Right: Reshaping is necessary on a single aspect of the tooth.

by osteoectomy as a two-walled infra-bony pocket because as a rule the lesion is much too wide and open to make it possible for new bone to fill in.

The exact architecture of the lesion must be carefully examined in order to determine if it is preferable to resect both the buccal and the lingual osseous walls of the crater (Figure 5 [left]). In many instances acceptable results can be obtained by the resection of a single osseous wall, thus conserving more of the supporting tissues (Figure 5 [right]).

Furcation Involvement.—Not so many years ago the involvement of the bifurcation or trifurcation of the roots of a molar used to be considered as a definite indication for the extraction of a tooth. A lesion of this type was considered as a tortuous pocket, one which could be neither eliminated nor even adequately cleaned out by the dentist not to speak of the problems of subsequent maintenance.

In recent years it has been shown repeatedly that many a furcation involvement can be treated in such a way as to eliminate the pocket completely and make maintenance possible for a careful and reliable patient.

The great difficulty involved in treating a furcation involvement comes from the presence of bony deformities, and very often from the presence of an infra-bony pocket extending deeply between the roots of the involved molar. Here again the removal of the osseous wall of the pocket by osteoectomy followed by careful reshaping of the bone is the answer to a difficult therapeutic problem (Figure 6).

The interradicular bone is shaped much like the septum would be shaped in a normal interproximal space. Sometimes some of the buccal plate of bone has to be removed over the mesial and distal roots to blend the outline of bone into a smooth outline and produce a finished result that is fairly easy to maintain.

Irregular Bone Margins.—If bone resorption occurs evenly around all the teeth

the margin of the alveolar process will be in a near straight horizontal line even if the pockets are fairly deep. In that event gingivectomy will result in permanent elimination of the pockets with entirely satisfactory and lasting results.

If, however, resorption of the alveolar process is very marked around certain teeth and almost negligible around neighbouring teeth, the bone margin will be very irregular with sharp changes in its level.

To eliminate the pockets by removal of the outer pocket wall in such a case it would be necessary to resect a band of soft tissue that would be scalloped in a very irregular fashion. Any attempt to treat such a case by gingivectomy is bound to fail and many of the pockets will recur rapidly.

In the areas where the pockets are deep the gingiva will re-grow to a level consistent with the level of the attachment over the teeth which have experienced little or no bone resorption. A new soft tissue outer pocket wall will be created over the more involved tooth and the disease process will not halt there.

In order to correct such a situation it is necessary to alter the bone form by removing some bone over the less involved teeth until the margins of the bone have been brought to a consistent level so that the whole contour can be reshaped in order to blend into a smooth contour. Only then can we expect the gingiva to heal correctly without pockets and with proper physiological form.

Clefts.—At times we may be faced with the problem of a single cleft. The gingiva is deeply receded over the buccal surface of a single tooth in a mouth that is otherwise free from periodontal disease. This situation will be encountered most frequently in the lower incisor area where most of the buccal plate will be missing from a single tooth while the remaining bone of the alveolar process will be intact.

Such an enormous inconsistency in alveolar bone level can be corrected through



FIGURE 6 Section through an involved bifurcation of a lower molar. Soft tissue and bone has to be resected along the dotted lines to obtain soft tissue healing and pocket elimination. B, Bone; AE, Epithelial attachment.

a radical osteoectomy with good results. Sometimes this is the only possible approach. On the other hand, one naturally has reservations about the great amount of bone which must be sacrificed in an operation of this kind.

The Grupe and Warren "Sliding Flap Operation"¹³ (Figure 7) sometimes makes it possible to correct such a deformity in a more satisfactory manner by creating new attachment of a flap of soft tissue to the denuded surface of the tooth. The area over the denuded tooth is scaled and all the diseased marginal gingiva is resected down to the attached mucosa. A vertical incision is made one or more tooth laterally in the healthy gingiva to permit lifting a flap of tissue by sharp dissection, leaving the periosteum on the bone. The flap is swung laterally to cover the denuded tooth and is sutured into place. The donor site is left exposed and the whole area is covered with a surgical dressing while healing takes place. If the operation is successful the flap will attach itself to the tooth, the resulting gingival attachment will be considerably

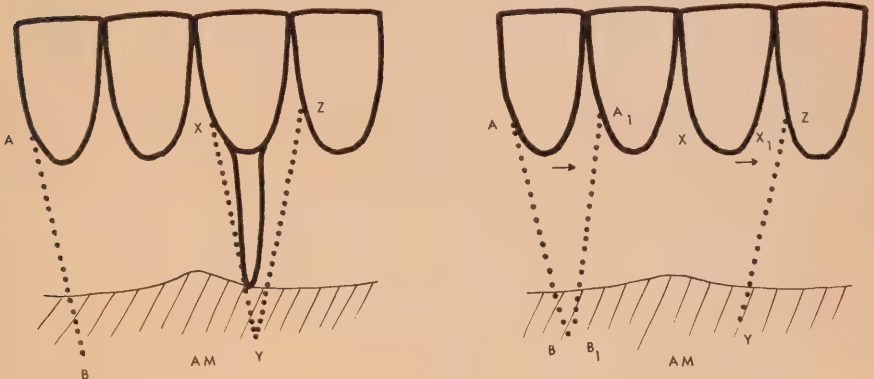


FIGURE 7 Left: Gingival cleft on the mandibular central incisor extending to alveolar mucosa, AM. An incision is made along X Y Z to remove diseased marginal tissue. A second incision is made along AB. The interdental papillae between A and X must be divided vertically. Right: The flap is swung from A to A-1 and X to X-1 and sutured along ZY. The area A, B, B-1, A-1, is left open to granulate under a surgical dressing. New attachment should form over the root in area X Y Z.

incisal to the original level and the sulcus will be of normal depth. Should no attachment take place the condition can still be treated by osteotomy and mucogingival surgery.

SUMMARY

A great variety of surgical techniques are presently at the disposal of the dentist interested in periodontal therapy. They are most useful tools and the results obtained warrant the enthusiasm of the proponents of these techniques.

It must be borne in mind, however, that surgical techniques are not an end in themselves and that they do not represent the ultimate goal of periodontal therapy.

Surgical techniques will be useful only if they are properly integrated in our whole concept of periodontal therapy. An accurate diagnosis and prognosis based on careful examination of the patient and objective clinical experience will always be the first step in the treatment of periodontal disease. Careful elimination of all causative agents and improvement of the functional factors will always be necessary preparatory to the successful application of surgical techniques.

RÉSUMÉ

La simple présence d'un excès de profondeur de la crevasse gingivale suffit à perpétuer la lésion qui s'approfondira continuellement. Il est donc absolument indispensable de réduire à zéro la profondeur de la crevasse gingivale si l'on veut arrêter définitivement le progrès de la maladie périodentaire.

Depuis dix ans les techniques chirurgicales ont progressé de façon remarquable et l'on comprend aujourd'hui qu'il vaut mieux éliminer le sac de façon radicale que de conserver une lésion qui s'aggrave sans cesse.

Le curettage subgingival constitue une étape essentielle dans la préparation initiale du cas mais seul l'opérateur doué d'une dextérité peu commune pourra

traiter totalement un cas grave de cette façon.

La gingivectomie est l'opération de base la plus utile surtout en présence de résorption régulière. Le flap sera plus utile lorsque le dommage osseux est irrégulier quant à sa profondeur. Ces deux techniques serviront de préambule à l'ostéoplastie et à l'ostéectomie de même qu'à la chirurgie muco-gingivale.

Les deux premières opérations se proposent de corriger l'architecture osseuse déformée par la maladie alors que la dernière modifie le vestibule de la bouche lorsqu'il est nécessaire de le faire pour éliminer les sacs de façon permanente.

L'auteur discute aussi l'application de ces techniques à des problèmes spéciaux.

Enfin quelle que soit l'utilité des techniques chirurgicales il ne faut pas en faire le but de notre thérapeutique. Seuls un diagnostic et un pronostic adéquats suivis de la correction des causes et de l'amélioration des facteurs fonctionnels pourront préparer un cas à profiter du traitement chirurgical.

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Common periodontal problems

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Periodontists stress the fact that the restoration and maintenance in health of the mouth as a whole is the very basis of dental practice. Because of this, the restoration of a tooth, the design and construction of partial dentures, the use of crowns and bridges, the role of orthodontic therapy and the extraction of teeth are all to be considered as much periodontal therapy as any other form of treatment. It is imperative that the practitioner should realize the interdependence of all forms of therapy toward the end of keeping the patient healthy. Though there are many problems which the practitioner must face and correct, only three common problems will be considered here: gingival bleeding, gingival hyperplasia and the third molar. The very fact that they are common problems, does not make them any easier to handle. On the contrary, it is because there are so many variables at play, that these conditions are all the more difficult to handle.

GINGIVAL BLEEDING

Whatever the aetiology, the gingiva will bleed for two reasons. First, because the crevicular epithelium either ulcerates or becomes so thin that it can no longer form a protective barrier. Secondly, because there is an increased number of capillaries in the gingiva whose walls have for one reason or another become more fragile. With a moment's reflection one can see that there are in fact, a vast number of diseases which would allow either one or both of these conditions to occur. Because of this, the writer excludes all

systemic diseases which may manifest themselves by gingival bleeding, for the very simple reason that they are not common. Secondly, he omits discussion of acute infections of the gingiva because they deserve separate consideration. This then leaves us with the most common problem, gingival bleeding due to chronic inflammation.

Florey (1958)¹ points out that inflammation is a process and not a state, and that the inflamed area undergoes continual change. Inflammation can be defined as "a succession of changes which occur in a living tissue when it is injured, provided that the injury is not of such a degree as at once to destroy its structure and vitality." When considering gingival inflammation one must keep this in mind. Whenever we see a patient with chronic marginal gingivitis, we only see him at one single moment of time in the natural course of inflammation affecting specific tissues.

The causes of inflammation are usually described under three main headings: physical, chemical and bacterial. Often there are combinations of these factors and we see this particularly in the gingiva. The problem is to resolve the number of aetiological agents which produce the inflammatory response. For if the aetiological factors can be corrected or eliminated, the gingival inflammation will resolve and the tissues will be restored to health. Also bearing on the outcome is the natural resistance of the patient to injuries which cause inflammation. This at the moment is rather an unknown quantity experimentally, though it is well established in clinical practice.

Of all the aetiological factors which may cause a chronic inflammation of the

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gingiva, subgingival calculus is the most common and important. There is little doubt that if this single factor could be kept under control, the numbers of mouths mutilated by extractions because of advanced chronic periodontitis would be markedly reduced. For this reason consideration is given in this paper to the formation of calculus, the instruments used for its removal and the theoretical basis for curettage.

This is not to deny that there are other important aetiological factors which need correction, and that an efficient regime of oral hygiene will do much to reduce gingival bleeding. But these factors deserve separate treatment.

Calculus

Clinically, calculus can be divided into supragingival or salivary calculus and subgingival or serumal calculus. The latter terminology may be slightly old-fashioned, but it indicates the possible source of the calcareous deposits. With the work of Waerhaug (1955),² who showed that both in dogs and humans, a dye could not be made to penetrate the periodontal pocket, and more recently Brill and Krasse (1958),³ who have shown the passage of tissue fluid from the gingival crevice outwards to the oral cavity, doubt is thrown onto the common origin of supra- and subgingival calculus, even though they appear to be structurally the same. Zander (1953)⁴ and Shroff (1955)⁵ have both shown the attachment of subgingival calculus to cementum to be more than was originally supposed, thus to some extent explaining the difficulty often encountered in removing these deposits.

Regardless of whether calculus causes gingival inflammation by physical or bacterial means or both, it causes inflammation as long as it remains in the gingival crevice and when it is removed the gingiva heals (Waerhaug, 1955).⁶ Of course, if the method of calculus formation were known, it might be possible to prevent its formation and the subsequent inflamma-

tory reaction. As Leung (1962)⁷ points out, if dental caries is a complex problem, then the formation and relationship of calculus to periodontal breakdown, may be even more so. Certainly the thought of an enzyme inhibitor in a suitable vehicle, used locally in the mouth for the prevention of calculus formation is a very intriguing one. Recently, Ennever and Sturzenberger (1961)⁸ tested a pancreatin preparation in chewing gum and found in a group of 19 subjects, that the recurrence of supragingival calculus could be reduced by 24 per cent. The group is small, the effects not terribly dramatic, and the type of calculus was supragingival. This the authors realize; yet it may be the first of many steps in the direction of producing a substance which will inhibit calculus formation.

The problem, however, is that the previous work quoted seems to indicate that there may be two different sources from which calculus could be formed. We know from clinical experience that subgingival calculus is more dangerous to the patient and more difficult to control. So at the moment we seem to be little closer to the answer than Rehwinkel⁹ was in 1877, when he said of that "formidable class of diseases of the gums which are difficult to classify . . . some claim that they are caused by chronic inflammation of the root membrane, aggravated by constitutional causes; while others think that they are entirely local, having their origin in foreign deposits."

Removal of Calculus

Supragingival calculus can be seen easily and removed by practically any instrument in the dental cabinet. As a general rule the heavier and coarser instruments are used for the heavy calcareous deposits while smaller and finer instruments are used for small and very adherent deposits. From a questionnaire, Forrest (1961)¹⁰ found that practitioners were in favour of four instruments for the removal of supragingival deposits: the



FIGURE 1 The working end of a chisel type scaler and tungsten carbide Jaquette scalers Nos. 1 and 2. Notice the soldered tips of tungsten carbide on the working end of the Jaquette instruments.

chisel or watch-spring type scalers and Jaquette scalers Nos. 1, 2, and 3 (Figure 1). It is of interest to note that these latter scalers are now being produced with tungsten carbide cutting surfaces and that No. 2 and 3 Jaquette scalers are incorporated into a double-ended instrument. The advantages are twofold; it reduces the number of instruments and saves the trouble of continual sharpening.

Since subgingival calculus is probably the principal aetiological agent in producing a chronic marginal gingivitis—periodontitis, its detection and removal is of prime importance. This is not as simple as might at first appear because it is a very illuminating and chastising experience to "thoroughly" scale a tooth prior to extraction, and then following extraction, to notice how much one has left behind, still firmly attached to the tooth.

The detection of subgingival calculus is a problem, and there is no simple panacea. Careful examination of the subgingival

area by use of either a Briault probe (Wade, 1960)¹¹ or a Cross calculus explorer (Cross, 1953 and Trott, 1961)^{12,13} demands a light and sensitive touch quite different to that used when trying to detect caries. Not all that one feels in the subgingival space is necessarily calculus and one has to learn what different sensations mean (Figure 2).

Drying of the gingiva and reflection of the margin by a gentle stream of warm air helps to deflect the gingiva and enables the dentist to see the subgingival deposits by direct vision.

It is one thing to find the calculus and quite another to remove it. There appear to be two main streams of development in this field. One is the development of suitable hand instruments which will retain their sharpness, and the other is in the field of mechanically operated points. The latter are still experimental at the moment, but there is little doubt that in the not too distant future some suitable mechanical device will be produced. For the moment, however, we will consider the commonest instruments used for subgingival scaling and curettage.

There are a number of requirements for such an instrument. It must be fine enough to be passed down into the subgingival area without too much discomfort to the patient, yet it will need to be strong enough to remove the tenacious subgingival deposits. It must be sharp. It needs a certain amount of flexibility, but not too much. It needs to be shaped so that it is accessible to root surfaces. For these reasons, the most commonly used instruments for subgingival scaling are the hoes, curettes and the Jaquette scalers which can be used both anteriorly and posteriorly. The watch-spring or chisel scaler and the fine sickle scalers can be used mostly in the anterior region. These instruments can be made of either carbon steel or tungsten carbide steel. There have been manufacturing problems with the latter type. Although tungsten carbide steel is hard and can keep a sharp edge, it is extremely brittle. So until recently these instruments were bulky, not of a uniform

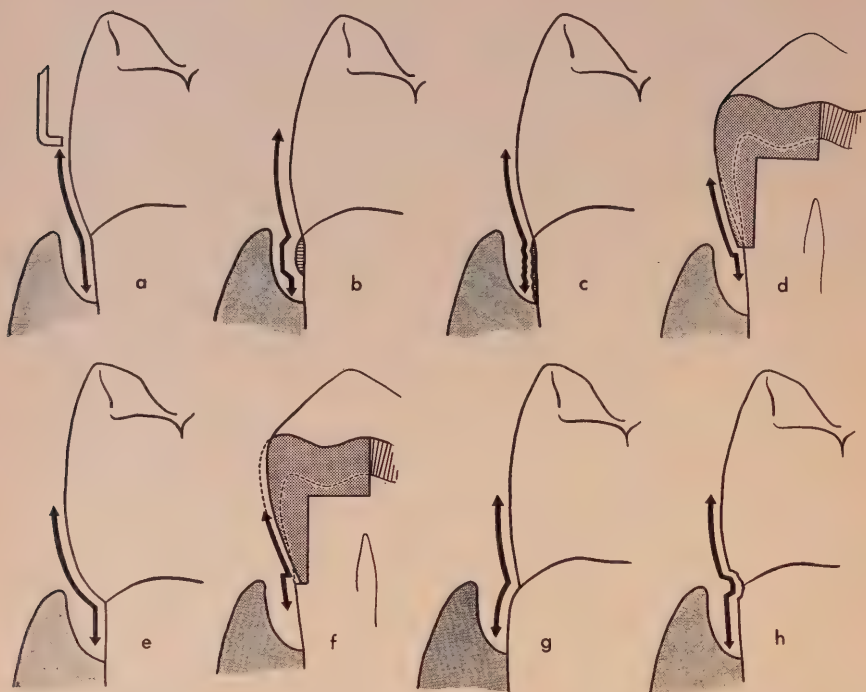


FIGURE 2 (a) The path which an explorer will take along the root surface when there is no abnormality present. (b) Calculus on the root surface will interfere with the insertion and withdrawal of an explorer as shown by the arrow. (c) Some subgingival deposits will impart a gritty sensation rather than that of a definite ledge. (d) An overhanging restoration will give a sensation as shown by the arrow and must be differentiated from (b). (e) A large crown and a narrow root is an anatomical variation that must be recognized. (f) A deficient restoration at the gingival margin will give the opposite sensation to that of an overhanging restoration (d). (g) A rare anatomical variation which must be recognized is a large root and a small crown. (h) A cavity below the gingival margin or erosion will transmit a sensation of the explorer dipping into the tooth. (After Trott: *The Cross Subgingival Calculus Explorer*. D. Digest 67:481, October 1961.)

size, brittle and expensive. Many of these problems have been overcome now and the tungsten is either soldered or flamed onto the working end of the instrument (Figure 3).

Hoes.—These, as the name implies, are shaped like garden hoes. The McCall pattern is the most widely used and satisfactory (Figure 4). Orban and Manella (1956)¹⁴ were not enthusiastic about hoes as they considered them too bulky.

There is little doubt from their data (Table 1) that the hoes available to them at that time were not satisfactory. The enthusiasm of Cross (1957)¹⁵ induced some manufacturers to produce finer instruments in the tungsten carbide steels and one can see that a much more satisfactory instrument was available to him. Table 1 compares three different makes of hoes now available. Column I refers to a carbon steel instrument, column II a tungsten carbide instrument supplied approximately 18 months ago, and column III the most

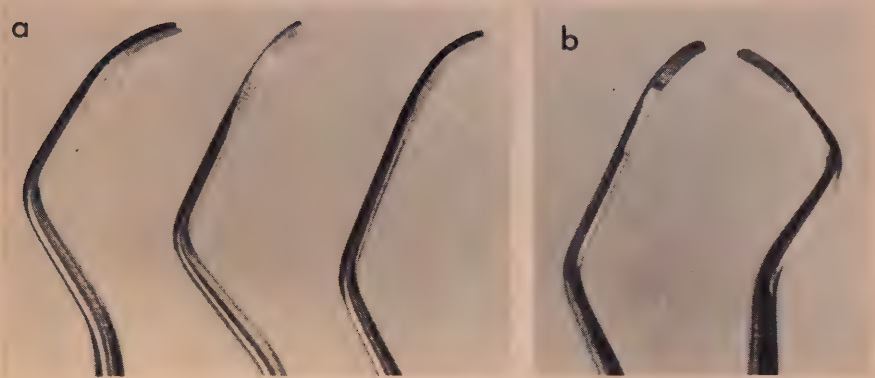


FIGURE 3 (a) Tungsten carbide curettes with soldered working tips. (b) Tungsten carbide curettes with flamed working surfaces.

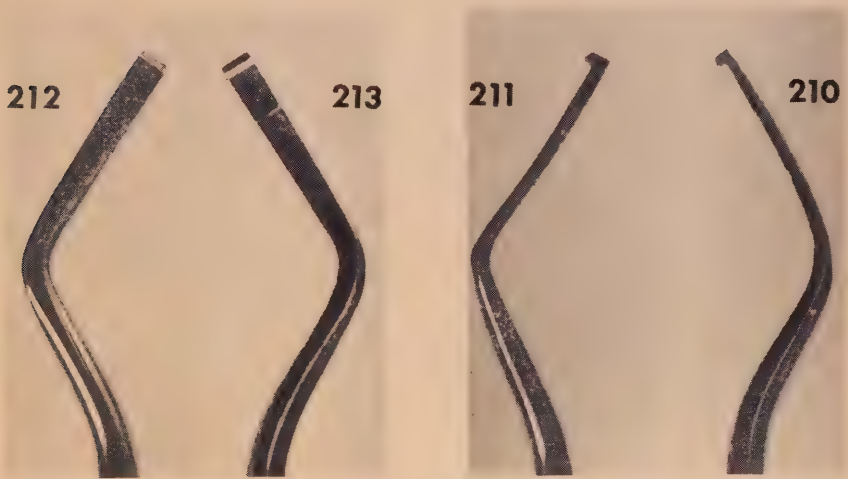


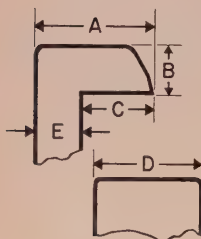
FIGURE 4 A selection of four soldered tungsten carbide McCall type hoes. Nos. 212 and 213 are in one double ended instrument and Nos. 210 and 211 in another.

recent tungsten carbide model. The dimensions of the carbide hoes are very comparable to those made in carbon steel, and the most recent figures are considerably less than the minimum dimensions given by Orban and Manella (1956),¹⁴ and

slightly less than those by Cross (1957).¹⁵ Scaling in both the posterior and anterior regions, buccally and lingually, and curettage can be very easily and satisfactorily performed with these instruments.

TABLE 1 Measurements taken from carbon steel and tungsten carbide hoes now available and compared with previous reports on instrument sizes.

	I	II	III	IV	V
	Carbon Steel	T.C. Hoe	T.C. Hoe	ORBAN & MANELLA(1956)	CROSS(1957)
A	A=0.6	A=0.7	A=0.6	A=0.65-1.2	A=0.75
B	B=0.2	B=0.3	B=0.3	B=0.5-0.95	B=0.5
C	C=0.4	C=0.3	C=0.2	C=no figures	C=no figures
D	D=0.9	D=0.9	D=0.7	D=no figures	D=0.85
E	E=0.2	E=0.4	E=0.4	E=0.35-0.6	E=no figures
Length	=11mm.	Length =11mm.	Length =11mm.	Length =no figures	Length =12-13mm.



Curettes. — Shaped like an elongated narrow curved spoon, the McCall pattern instruments are some of the most useful in periodontal therapy (Figure 5). The main drawback in the past has been the difficulty of sharpening them correctly, and unless the instrument is sharp, it is of little use. Table 2 compares the dimensions of four carbon steel and four tungsten carbide curettes from different manufacturers. The tungsten carbide instruments compare favourably with the carbon steel ones in all dimensions except the depth of the blade (C), and the figures are below those by either Orban and Manella (1956),¹⁴ or Cross (1957).¹⁵ The dimensions of the instrument in column V are more akin to the carbon steel instruments than any other and this no doubt is due to the flaming process which has been used for attaching the tungsten carbide to the instrument. Forrest (1961)¹⁰ has reservations about the ability of the tungsten carbide curettes to retain their sharp edge, and sharpening them according to him is impractical. Cross (1957)¹⁵ points out that a set of tungsten hoes were used for twenty-one months without sharpening. So far the tungsten carbide soldered curettes used at the Faculty of Dentistry of the University of Manitoba over the last six months have retained their sharpness,

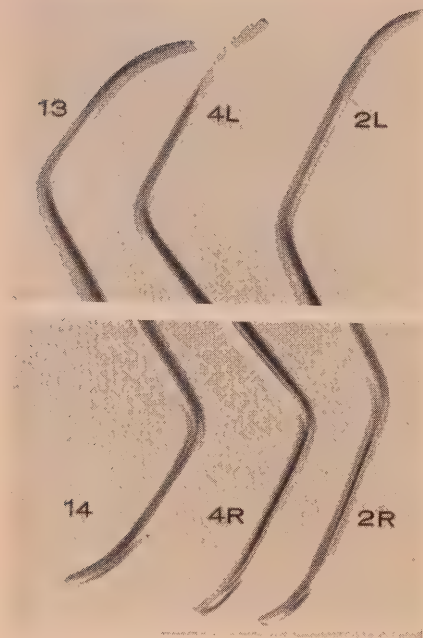
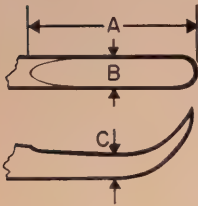


FIGURE 5 A selection of six soldered tungsten carbide McCall type curettes. Nos. 2L and 2R are in one double ended instrument, Nos. 4L and 4R in another, and Nos. 13 and 14 in another.

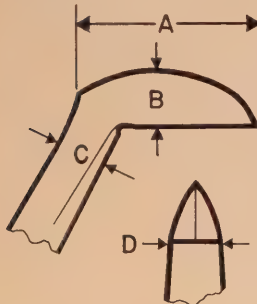
TABLE 2 A comparison of the sizes of four carbon steel and four tungsten carbide curettes. Previous figures are shown in columns IX and X.



I	II	III	IV	V
Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel	T. C. Flamed
A=5 mm. B=0.6 mm. C=0.45 mm.	A=6 mm. B=0.6 mm. C=0.25 mm.	A=6 mm. B=0.5 mm. C=0.25 mm.	A=6 mm. B=0.5 mm. C=0.3 mm.	A=6 mm. B=0.5 mm. C=0.3 mm.

VI	VII	VIII	IX	X
T.C. Soldered	T.C. Soldered	T.C. Soldered	Orban & Manella (1956)	Cross (1957)
A=4 mm. B=0.5 mm. C=0.4 mm.	A=5 mm. B=0.5 mm. C=0.4 mm.	A=2 mm. B=0.6 mm. C=0.4 mm.	B=0.75-1 mm. no other figures	A=no figures B=0.57 mm. C=0.6 mm.

TABLE 3 A comparison of one of the most recent tungsten carbide Jaquette scalers with one illustrated by Cross (1957).



I	II	III
T.C. JAQUETTE	CROSS (1957)	ORBAN & MANELLA (1956)
A=2.6 mm. B=0.8 mm. C=0.7 mm. D=0.6 mm.	A=no figures B=1.15 mm. C=no figures D=1.2 mm.	no figures

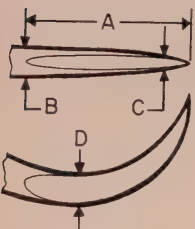
even in the hands of undergraduate students. But it will be interesting to see how the flamed-tipped instruments stand up to use compared with the soldered instruments.

Jaquette Scalers. — As these instruments are very popular with practitioners, Table 3 compares the measurements of the most recently produced tungsten carbide instrument to a carbon steel instrument illustrated by Cross (1957).¹⁵ The new instrument compares favourably with the older one and there is no reason to believe

that it will not stand up to the strain of use as well as the hoes mentioned earlier. This is not as finely built an instrument as either the hoes or curettes. Therefore it is mainly used for the removal of bulky supragingival calculus and heavy superficial subgingival deposits (Figure 1).

Fine Sickle Scaler. — Sickle scalers vary considerably in their dimensions from a short, squat heavily built blade, to a long fine thin instrument. Each type has its place. The former is particularly useful

TABLE 4 A comparison of the dimensions of a fine sickle type scaler.

	I	II	III	IV
	CARBON STEEL	T.C.SICKLE	ORBAN & MANELLA (1956)	CROSS (1957)
	A=12 mm. B=0.8 mm. C=0.3 mm. D=0.7 mm.	A=10 mm B=0.7 mm. C=0.2 mm. D=0.8 mm.	C=0.2-0.4 mm	no figures

for heavy deposits of supragingival calculus lingual to the mandibular anterior teeth, whilst the fine one can be used for the subgingival deposits which occur interproximally in the same region. It can be seen from Table 4 that either carbon steel or tungsten carbide instruments come within the range recommended by Orban and Manella (1956)¹⁴ (Figure 6).

Scaling and Curettage

It is rather depressing to find the *Oxford Dictionary* (1956) give as one of its definitions of scale—"Incrustation inside boiler etc., tartar on teeth"—for one can only presume that the authors would look upon the scaling of the teeth in the same manner as one might chip away the scale inside a boiler. The terms, scalers and scaling, must be lost in the antiquity of dental literature, for as recently as 1891 Harris said it is "an old name for the operation, which consists of the removal of salivary calculus, commonly called tartar from the teeth," whereas curettage is mentioned by Dunning and Davenport in 1936¹⁶ as "scraping or cleaning a cavity or a surface by means of a curette."

These two words are bandied about freely without realizing their implication. Scaling or the removal of calcareous deposits from the enamel and cementum of the teeth must be carried out before ce-

mentum curettage can be done. With the realization that organisms can not only adhere to but penetrate parts of the cementum (Zander, 1953)⁴ came the rational approach to root planing or curettage.

There are, however, additional reasons for curetting the cementum. Cross-sections of undecalcified teeth show a number of anatomical and pathological variations which must be taken into account. The cementum of a tooth is not perfectly smooth but shows a wavy undulating sur-



FIGURE 6 A fine flamed tungsten carbide sickle.

face. Since calculus follows the surface contour, mere scaling would remove the most protruding parts of the deposits and leave small pieces behind which would act as a nidus for further deposits to form (Figure 7). In some areas cementum is lost for one reason or another and calculus grows into these areas so that only a thorough root curettage will remove the deposits and produce a smooth surface (Figure 8). As periodontal membrane destruction takes place and pockets are formed, areas of the root show small resorption lacunae which can become filled with calculus (Figure 9). A further complication is that some areas of the root show calculus undermining the cementum and unless these areas are thoroughly treated by curettage, the prevention of further rapid calculus formation becomes well nigh impossible (Figure 10).

Besides curettage of the cementum, some authorities consider it also necessary to curette the adjoining gingival crevicular epithelium and the epithelial attachment (Wade, 1957).¹⁷ It is debatable whether this is always necessary, but when there is calculus attached to cementum, mere removal of the calculus without root planing or curettage of the root surface is not sufficient.

Not only is the manner of the attachment important but also the relationship of the calculus to the soft tissues. Waerhaug (1952)¹⁸ found that calculus situated below the cemento-enamel junction was about 1.3 mm. from the base of the pocket, and Wade (1957)¹⁷ found the average distance from the base of the pocket to the alveolar bone crest to be 0.97 mm. This last figure is not to be construed as an absolute one because the measurements were taken from wax-embedded decalcified sections, and during the processing considerable shrinkage occurs (Staple, 1962).¹⁹ So although we are working within reasonably fine limits, one must remember that "in vivo" gingival tissue can be displaced and compressed, and that with the right instrument the removal of calculus and planing of the root surface is a biological possibility.

As a student the accompaniment of gingival haemorrhage with the operation of scaling was considered a heinous offense. However when one considers the anatomy and pathology of the subgingival area, it must be appreciated that it is a physical impossibility to scale and curette the teeth properly without causing some bleeding. And the reason why gingiva will bleed on brushing while calcareous deposits are still present must be equally obvious. However, once calculus is removed, the root smoothed, and good oral hygiene instituted, there is no reason why in the majority of patients gingival bleeding should continue, for resolution will occur and the gingiva will be restored to health.

GINGIVAL HYPERPLASIA

There is usually little difficulty in arriving at a diagnosis of a chronic marginal hyperplastic gingivitis. While there are a number of other reasons for gingival hyperplasia, inflammation is the most common one. It has been pointed out previously (Trott, 1962)²⁰ that the gingiva has four main basic clinical reactions to low grade, long standing irritations. All these reactions are chronic inflammatory in nature but differ quite widely in their clinical manifestations. Although there is no simple solution to the problem, it is worth examining more closely the histological changes that take place in chronic inflammation, and to try where possible to correlate them with the clinical changes.

Payling-Wright (1950)²¹ points out that one of the vital differences between acute and chronic inflammation is that the former is "exudative" and the latter "proliferative." But the problem is not as simple as that, for the phenomena of inflammation and repair exist together, one sometimes predominating over the other, so that there is an intermingling of defensive and reparative processes. Because this situation exists there is a "heterogeneity of the local cell population, and in

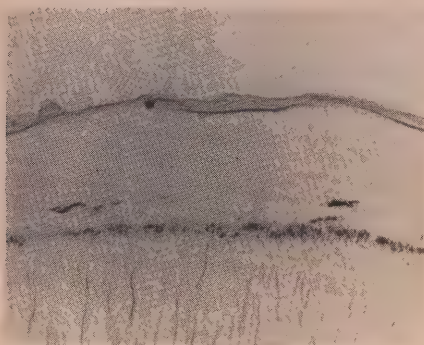


FIGURE 7 An undecalcified cross-section of a tooth showing the undulating cementum surface covered with calculus (X 60).

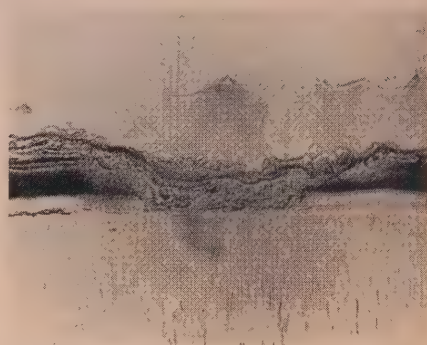


FIGURE 8 A small piece of cementum has been lost and the area has been filled in with calculus. There is no apparent change in the dentine (X 60).



FIGURE 9 Howship's lacunae in the cementum showing the bag-like resorption areas (X 60).



FIGURE 10 An early horizontal undermining of the cementum by calculus can be seen to the left of this section (X 60).

chronic inflammatory reactions, leucocytes of all kinds, histocytes, fibroblasts and vascular endothelial cells may all be present simultaneously in large numbers" (Payling-Wright, 1950).²¹

Many diverse cellular reactions can be observed with chronic inflammation and one only has to consider the different microscopic appearances of a chronic marginal gingivitis, pyogenic granuloma, and a peripheral giant cell reparative granu-

loma in order to realize that even in the gingiva there is a tremendous range of activity. There is no reason why this should not be so, since the basic mesenchymal cells are present in the gingiva as they are elsewhere in the body.

Besides this, there is the problem of the stimulus to cell proliferation. We know that under certain circumstances and with cells capable of multiplying that proliferation, i. e. hyperplasia, can and does occur.

The stimuli vary widely but they all produce cell proliferation. There is compensatory hyperplasia when part of an organ is lost and regeneration takes place by cell multiplication as well as enlargement of the cells (hypertrophy). Hormonal hyperplasia occurs when certain organs or tissues are enlarged due to hormone stimulation. The reaction to infection by certain viruses will sometimes produce a hyperplasia. Wound repair can show the most bizarre reactions such as occur in cheloid formation. Last but not least, there is the borderland between controlled hyperplasia and uncontrolled hyperplasia or neoplasia. There is still much which is unknown and speculative about cell multiplication. Such questions as what initiates the mitotic activity in a healing wound, and what tells the cells to stop once the breach is healed are as yet unanswered.

So in the gingiva we are faced with a peculiar set of circumstances. Local irritants usually cause a chronic marginal gingivitis with moderate signs of inflammation—swelling, redness, heat and pain. Yet on other occasions there will be cell proliferation or hyperplasia, when the gingiva will be enlarged, firm, stippled, normal in colour and painless. Local irritation is still present but does not appear to be sufficient to cause the entire gingival reaction of hyperplasia.

The diagrammatic illustrations in Figure 11 may to some extent help correlate the histological appearance with the clinical features (A) represents healthy gingiva showing the normal colour, contour and consistency that we expect to see in a healthy mouth. In (C) a certain amount of gingival enlargement has occurred due to an inflammatory reaction when there is an increased number of chronic inflammatory cells in the area, dilatation and an increase in the number of the small capillaries, as well as an exudate from the vessels into the tissue spaces. Clinically, the gingiva will be swollen, soft, red, haemorrhagic, slightly tender to palpation and there will be pitting on pressure when a blunt probe is pressed on the gingiva,

i.e. oedema. At the other extreme, in (B) there has been a marked proliferation of fibrous connective tissue, formation of mature collagen and small isolated islands of chronic inflammatory cells, but nothing else very significant. Here the gingival swelling will be firm, normal in colour, often stippled, not tender to palpation, nor will it bleed easily on probing, and one will not be able to elicit the sign of pitting oedema. Between these two extremes is (D) where the gingival swelling is a combination of inflammation and hyperplasia, and, as pointed out earlier, there is a wide variation in the cellular reaction, manifested by a range of clinical appearances.

It must be apparent by now that the aetiology of chronic hyperplastic gingivitis cannot be simple. It would seem that on the one hand there must first be a number of local irritating factors present, and on the other, an unpredictable tissue response. A favourable prognosis hinges on the ability to remove or correct all the possible aetiological factors. Thus the dentist will be more successful in treating those cases where he can isolate and correct the aetiological factors, and less successful when this cannot be done. The treatment will accordingly range from the very simple removal of calculus to periodontal surgery and orthodontic treatment. And there is always the possibility that a number of cases may relapse for the simple reason that we have failed to appreciate all the aetiological factors involved.

PERICORONITIS

Pericoronitis is an inflammation of the gingiva surrounding the crown of an erupting tooth. Since it is an inflammation of the gingival tissues around a tooth, Wade (1960)¹¹ suggests that in principle it is therefore a gingivitis, but in a localized area, and under a special set of circumstances. Kelsey Fry (1958)²² takes the view that the inflammation occurs in the dental follicle of the developing tooth

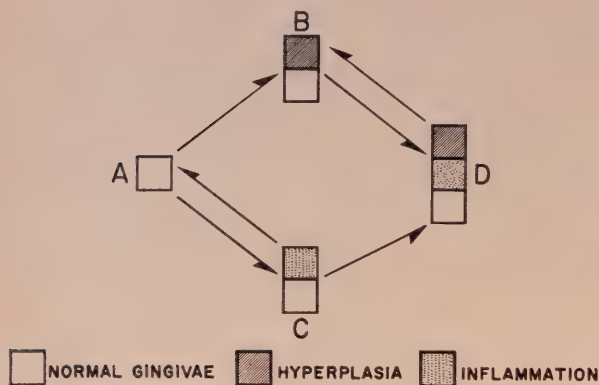


FIGURE 11 Diagrammatic representation of the pathological changes which can occur in the gingiva when it becomes enlarged. As the arrows indicate, some stages are reversible while others are not.

just as it erupts into the oral cavity and therefore terms it a folliculitis.

Anatomy. — Before considering the pathology and possible complications of this condition, one must briefly examine the anatomy of the gingiva surrounding the crown of a tooth and the adjacent structures. If we believe the epithelial attachment theory advanced by Gottlieb, then the gingival sulcus at the time of eruption of any tooth will be within the range of 1 to 2 millimetres. On the other hand, if there is a gingival cuff as suggested by Waerhaug (1952)¹⁸, and recently demonstrated in the developing teeth of monkeys by McHugh (1961),²³ then a potential space exists between the gingivae and the tooth from the occlusal or incisal surface to the cemento-enamel junction. This latter idea would to some extent account for the severity of an infection around an erupting tooth. Gingival inflammation is largely caused by stagnation, and though a pericoronitis can occur around any erupting tooth, it is more frequently seen around mandibular third molars than any other permanent teeth. It is also possible to consider "teething" in children as a form of pericoronitis, although usually this situation resolves itself without any interference

from the dentist, quite unlike the situation in the permanent teeth.

Aetiology. — The aetiology of pericoronitis is similar to that of other gingival inflammations. Primarily it is due to stagnation of food and other debris in and around the gingival cuff, producing an excellent incubation zone for the mixed oral flora to proliferate, and for the pathogenic bacteria to cause infection.

Trauma from the erupting tooth and/or the impinging of the maxillary third molar on the overlying gingival tissue, known as the operculum, aggravates the condition and adds to the stagnation. It is also a difficult area in which to maintain adequate oral hygiene and this, too, would add to the problem. Last but not least, the mandibular third molar is likely to be impacted, due mainly to the lack of space in most mandibular arches for three molar teeth. This means that the tooth usually erupts at an angle and thus aids in the formation of a stagnation zone.

Signs and Symptoms. — A pericoronitis is one of the few conditions which will bring a patient rapidly to a dentist's office. The lesion may be either chronic, sub-acute or acute. Only chronic inflammation concerns us here, for acute peri-

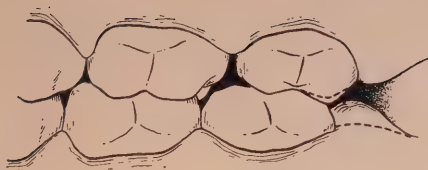


FIGURE 12 Drawing made from dental models of a 21-year-old man where maxillary and mandibular third molars have been extracted. The maxillary second molar has drifted distally and tipped so that the disto-buccal cusp impinges on the gingiva distal to the mandibular second molar.

coronitis deserves separate consideration.

In the chronic stage, the patient may complain of vague pain and discomfort in the region of the third molar and an occasional unpleasant taste. Examination will show a slightly reddened gingival flap over the unerupted or partly erupted tooth. There is usually a collection of food debris in the area and on probing with a blunt periodontal explorer, the gingiva can be lifted away from the crown and the extent of the pocket gently investigated.

Treatment. — The first decision to be made is whether the affected tooth will erupt satisfactorily into function or not. This decision will depend upon many factors such as the position of the maxillary third molar, the amount of room in the mandibular arch, the amount of caries in the mandibular second molar, the degree of impaction of the mandibular third molar, and so on. If it is decided to extract the mandibular third molar, then

the inflammatory condition should be brought under control, and the tooth removed at the earliest opportunity. This can usually be achieved by frequent rinsing with a solution of hydrogen peroxide in warm water for twenty-four hours.

On the other hand, if the mandibular third molar is to be retained, then surgical treatment of the gingival tissues is indicated. Although this can be done with any gingivectomy knife, it is by no means easy as the soft tissue around the third molar is very mobile and offers no resistance to the knife blade, so that control is difficult. Haemorrhage at the time of operation is also a problem. Thus the method of choice is diathermic electrosurgery (Blake and Trott, 1962).²⁴

Although removal of the maxillary and mandibular third molars may solve one problem, it can create another. On occasions the maxillary second molar will drift distally so that an open contact will be found between it and the first molar, allowing the mesio-buccal cusp of the mandibular second molar to become a plunger cusp in the interproximal area between the two maxillary molars. Also the distal cusps of the maxillary second molar may tip occlusally and impinge on the soft tissue behind the mandibular second molar, causing further chronic inflammation in this region (Figure 12). If this occurs, the periodontal pocket distal to the mandibular second molar should first be treated by electrosurgery to restore a satisfactory gingival contour in this area. Then the distal cusps of the maxillary second molar and probably the mesial cusps of the mandibular second molar

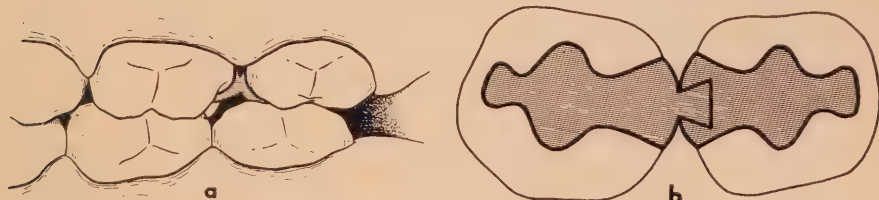


FIGURE 13 Drawing made from models taken following treatment of the case illustrated in Figure 7.

should be reduced so as to eliminate any further trauma. Lastly, the maxillary first and second molars should be splinted together so that no further distal drift can occur and the interproximal space is protected (Figure 13).

SUMMARY

A few aspects of some common periodontal problems have been discussed. Measurements of some of the modern tungsten carbide scalers and curettes available have been reported and the results compared with some previous investigations. There appears to be a general improvement in the design of these instruments in the last few years.

The problems of gingival hyperplasia have been discussed mainly from a histological viewpoint to illustrate some of the complexities of inflammation and repair.

Chronic pericoronitis around mandibular third molars has been considered. A problem that is likely to occur when the maxillary and mandibular third molars are extracted, has been discussed.

RÉSUMÉ

Quelques aspects de problèmes parodontales communs ont été discutés. Les dimensions de quelques curettes et rugines de carbure de tungstène furent mesurées, et les résultats comparés auprès d'investigations antérieures. Il paraît y avoir une amélioration dans la conception de ces instruments depuis les dernières années.

Les problèmes d'hyperplasie gingivale ont été discutés, principalement selon un aspect histologique afin d'illustrer quelques complexités de l'inflammation et de la réparation.

La pericoronite chronique autour de la troisième molaire a été considérée. Un problème qui peut probablement avoir lieu lorsque les troisièmes molaires sont extraites du maxillaire supérieur et inférieur, a aussi été considéré.

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Periodontics for the general practitioner

The family dentist of tomorrow must provide the bulk of the periodontal care which his patients require. This view, shared by informed dentists and dental educators alike, stems from the realization that a small number of periodontists cannot be expected to cope with the growing demand for preventive measures and timely treatment.

Periodontal disease is one of the great public health problems of our time. It is the main cause of tooth mortality in adults. In fact, the adult population has an almost universal requirement for periodontal care. Certainly, attention to periodontal disease constitutes one of the major responsibilities of the dental profession. That is why the Report of the Survey of Dentistry in the United States recommends that "dental schools should seek to develop curricula, by 1970 at least, which will educate dentists who are much more periodontically and biologically oriented than today's graduates." And that is why "the graduate of 1970 should possess many abilities similar to those of the best-trained periodontists of today."¹

Canada's thirty periodontists cannot possibly provide the volume of care which a problem of this magnitude demands. Like their American counterparts, Canadian periodontists find themselves more over-burdened with patients than do dentists in any other type of practice.² The task of providing adequate care must be more equitably shared between periodontists and general practitioners. The

latter, in particular, will have to take the lead in the application of preventive measures. These procedures can be financially rewarding to the general practitioner for, as the American Survey of Dentistry revealed, "the more preventive the practice, the higher the net income." According to the American Survey, higher incomes reflect busier practices and higher fees because of patient appreciation of preventive services.³ The inference is that the public not only needs attention to periodontal disease, but they seek such attention and will pay for it.

Nor should we forget that for more than fifty years we have urged the public to "see the dentist twice a year." Many have heeded this advice and, as a result, have retained their natural teeth for a considerable number of years. These people expect their dentists to continue to assist them so that they may preserve their teeth for life. They will certainly feel betrayed and resentful if they are suddenly told that the teeth must be extracted because of periodontal disease. "Did the periodontal disease develop suddenly?" or "Could it have been detected in its early stages?" and "Could it not have been treated successfully if it had been detected in its earlier stages?"—these are the questions which patients must logically ask and which test the conscience of the practitioner.

Periodontal disease frequently begins in early childhood but may progress slowly and unobtrusively for many years. By middle age, however, its existence is

usually quite obvious. Periodontitis simplex constitutes the majority of all cases of periodontal disease. It responds to simple therapy if detected early enough. The dental hygienist, directed by the dentist, can provide most of the treatment for this condition and can account for most of the chair time incidental thereto. But if periodontal disease is allowed to progress, treatment procedures become more complex and a larger portion of the treatment must be rendered by the dentist. Obviously, the earliest possible detection of any lesion is of the utmost importance.

A first step in the control of periodontal disease is regular, direct clinical examination of the periodontal tissues. Direct examination yields practically all the important evidence concerning the presence and nature of periodontal disorders. Radiographic examination not only fails to reveal early signs of periodontal disease, it also cannot provide complete and accurate representation of the more advanced manifestations. In examination of the periodontal tissues, direct vision, touch and hearing will usually provide nearly all of the important evidence, whereas radiographs may provide supplementary evidence only.

Unfortunately, those who perform elaborate periodontal therapy and equally

elaborate "full coverage rehabilitation" for cases of advanced periodontal disease are too often mistaken as being the ultimate experts of the profession. These procedures are of scant significance from a public health standpoint since probably less than one per cent of the public have the fortitude or the funds to avail themselves of this type of service. The dentist who detects and treats periodontal disease in its earliest stages, and for a much larger number of patients, renders a far greater service to the public.

The majority of our fellow Canadians can retain their natural teeth for life if they are given the type of care and attention described elsewhere in this special issue of the Journal. This information constitutes a succinct catalogue of present-day knowledge and practice in periodontics. As such, it is of value to every reader.

C.H.M.W.

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C.D.A. Brief to Royal Commission on Health Services • A limited number of copies of the brief submitted by the Canadian Dental Association to the Royal Commission on Health Services are available at Association headquarters. Copies may be secured on request to the Secretary, Canadian Dental Association, 234 St. George Street, Toronto 5, Ontario.

Recruitment to the Dental Profession • Each individual dentist, by virtue of example and service in the community can create a feeling of respect which encourages others to take up the profession . . . Each member of the profession has a contribution to make (in recruitment). — G. H. Leatherman, secretary-general of the Fédération Dentaire Internationale.

Dental personnel in Canada, 1963**Nombre des dentistes au Canada en 1963***Bureau of Economic Research*

There are 5,999 dentists registered in Canada, 101 of them women. During 1962, 173 dentists either retired from practice or died while 44 moved to other provinces or countries.

British Columbia still has the best dentist/population ratio. Since last year's report, increases in dentists and population have kept fairly well in step: the population increased 1.8 per cent and the number of dentists rose 1.6 per cent.

Il y a au Canada 5,999 dentistes enregistrés, dont 101 femmes. Au cours de 1962, 173 dentistes sont morts ou ont pris leur retraite; 44 ont changé de province ou ont quitté le pays.

La Colombie britannique a encore la meilleure proportion de dentistes en rapport avec la population. Depuis le rapport de l'an dernier, l'augmentation de la population et celle des dentistes a été parallèle: la population a augmenté de 1.8 pour cent, les dentistes de 1.6 pour cent.

Il n'en fut pas ainsi au cours des dix dernières années: la population s'est accrue

TABLE 1 Dentists registered in Canada, 1963 • Dentistes enregistrés au Canada en 1963.

Province	Total	Men Hommes	Women Femmes	Province
Newfoundland	44	42	2	Terre-Neuve
Prince Edward Island	31	31	0	Ile-du-Prince-Edouard
Nova Scotia	185	182	3	Nouvelle-Ecosse
New Brunswick	123	122	1	Nouveau-Brunswick
Quebec	1,434	1,417	17	Québec
Ontario	2,552	2,494	58	Ontario
Manitoba	281	280	1	Manitoba
Saskatchewan	195	193	2	Saskatchewan
Alberta	456	450	6	Alberta
British Columbia	698	687	11	Colombie britannique
Canada	5,999	5,898	101	Canada

TABLE 2 Changes in dental registers during 1962 • Modifications dans les registres en 1962.

Province	Dentists registered 1962 Dentistes enregistrés	Deleted from register Retraits des registres			Added to register Additions aux registres	Dentists registered 1963 Dentistes enregistrés	Province
		Deaths Décès	Retire- ments Retraites	Relocated Déménage- ments			
Newfoundland	43	0	0	0	1	44	Terre-Neuve
Prince Edward Island	29	0	0	0	2	31	Ile-du-Prince-Edouard
Nova Scotia	190	8	4	0	7	185	Nouvelle-Ecosse
New Brunswick	124	2	4	0	5	123	Nouveau-Brunswick
Quebec	1,417	16	15	5	53	1,434	Québec
Ontario	2,522	42	37	17	126	2,552	Ontario
Manitoba	283	12	5	5	20	281	Manitoba
Saskatchewan	193	1	2	5	10	195	Saskatchewan
Alberta	434	4	10	4	40	456	Alberta
British Columbia	671	2	9	8	46	698	Colombie britannique
Canada	5,906	87	86	44	310	5,999	Canada

TABLE 3 Relocation of Canadian dentists during 1962 • Migration des dentistes canadiens durant 1962.

To-A From-De	Nfld. • T.-N.	P.E.I. • I.-P.-E.	N.S. • N.-E.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C. • C.-B.	U.S.A. • E.-U.	Elsewhere Ailleurs	Total
Nfld. • T.-N.													0
P.E.I. • I.-P.-E.													0
N.S. • N.-E.													0
N.B.													0
Que.						3			1		1		5
Ont.					1		2		2	4	2	6	17
Man.						1				1	2	1	5
Sask.		1		1		1			1			1	5
Alta.	1							1		1		1	4
B.C. • C.-B.						1	1	1	2		2	1	8
Total	1	1		1	1	6	3	2	6	6	7	10	44

Over the past decade the picture is not so favourable; the population grew almost twice as rapidly as the supply of dentists. Saskatchewan has shown the greatest deterioration in the dentist/population ratio. While its population increased 10 per cent, the dental population declined 13 per cent. Only in Newfoundland has the number of dentists grown faster than the population and yet Newfoundland still has Canada's worst dentist/population ratio. There have been absolute decreases in the number of dentists in three provinces—Prince Edward Island, Nova Scotia and Saskatchewan.

There are 219 specialists in the three specialties recognized by the Canadian Dental Association—61 oral surgeons, 31 orthodontists and 27 periodontists. These specialties are certifiable in all provinces

presque deux fois plus rapidement que le nombre des dentistes. La Saskatchewan a subi la pire baisse dans sa proportion de dentistes en rapport avec la population: le nombre des habitants a augmenté de dix pour cent et celui des dentistes a baissé de 13 pour cent. C'est dans Terre-Neuve seulement que le nombre des dentistes a augmenté plus rapidement que la population et pourtant c'est dans cette province qu'on trouve, au Canada, la plus faible proportion de dentistes par rapport à la population. Le nombre des dentistes a diminué dans trois provinces: Ile-du-Prince-Edouard, Nouvelle-Ecosse et Saskatchewan.

Il y a 219 spécialistes dans les trois spécialités reconnues par l'Association dentaire canadienne: 61, en chirurgie buccale, 31, en orthodontie et 27, en périodontie. Ces trois spécialités sont reconnues

TABLE 4 Population per dentist and dentists per 10,000 population, 1963 • Population par dentiste et dentistes par 10,000 de population en 1963.

Province	Population per dentist Population par dentiste	Dentists per 10,000 population Dentistes par 10,000 de population	Province
Newfoundland	10,682	.9	Terre-Neuve
Prince Edward Island	3,419	2.9	Ile-du-Prince-Edouard
Nova Scotia	4,032	2.5	Nouvelle-Ecosse
New Brunswick	4,935	2.0	Nouveau-Brunswick
Quebec	3,742	2.7	Québec
Ontario	2,485	4.0	Ontario
Manitoba	3,327	3.0	Manitoba
Saskatchewan	4,769	2.1	Saskatchewan
Alberta	3,004	3.3	Alberta
British Columbia	2,377	4.2	Colombie britannique
Canada	3,096	3.2	Canada

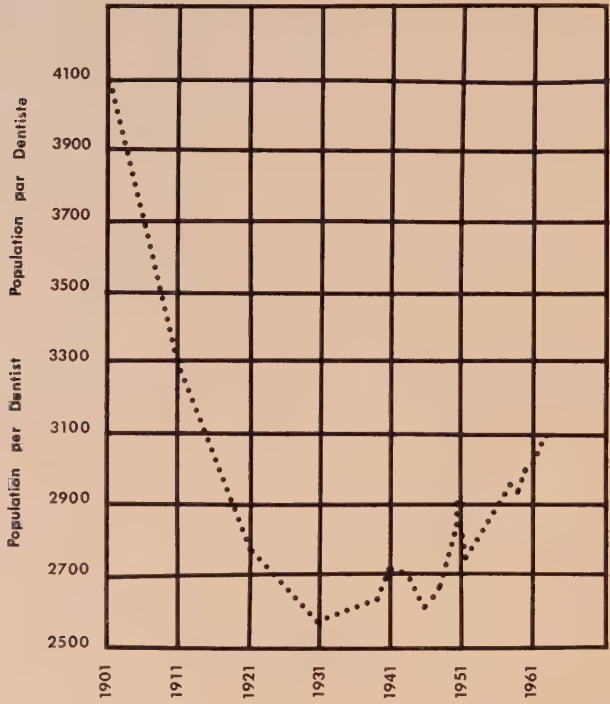


FIGURE 1 Population per dentist, Canada, 1901-1963 • Population par dentiste, Canada, 1901-1963.

TABLE 5 Absolute increase in dentists and per cent increase in dentists and population, by province, 1953-63 • Augmentation net des dentistes et pourcentage de l'augmentation des dentistes et de la population, par province, 1953-1963.

Province	Increase since 1953 Augmentation depuis 1953			Province
	Dentists - Dentistes		Population %	
	No.	%		
Newfoundland	20	83.3	25.7	Terre-Neuve
Prince Edward Island	—2	—6.1	6.0	Ile-du-Prince-Edouard
Nova Scotia	—12	—6.1	14.2	Nouvelle-Ecosse
New Brunswick	10	8.8	15.4	Nouveau-Brunswick
Quebec	192	15.5	28.6	Québec
Ontario	334	15.1	32.5	Ontario
Manitoba	23	8.9	17.2	Manitoba
Saskatchewan	—28	—12.6	10.3	Saskatchewan
Alberta	104	29.5	40.8	Alberta
British Columbia	143	25.8	37.7	Colombie britannique
Canada	784	15.0	28.4	Canada

TABLE 6 Full time dental specialists, 1963 • Nombre des spécialistes, 1963.

Province	Total	Specialists - Spécialistes			Province
		Oral surgery Chirurgie buccale	Orthodontics Orthodontie	Periodontics Périodontie	
Newfoundland	0	0	0	0	Terre-Neuve
Prince Edward Island	0	0	0	0	Ile-du-Prince-Edouard
Nova Scotia	7	2	4	1	Nouvelle-Ecosse
New Brunswick	3	0	3	0	Nouveau-Brunswick
Quebec	40	9	27	4	Québec
Ontario	125	35	71	19	Ontario
Manitoba	10	4	5	1	Manitoba
Saskatchewan	2	0	2	0	Saskatchewan
Alberta	14	4	10	0	Alberta
British Columbia	18	7	9	2	Colombie britannique
Canada	219	61	131	27	Canada

except Newfoundland, and some provinces certify other specialties as well.

Eighty-eight hygienists are now practising in Canada. This is an increase of only five since last year.

dans toutes les provinces, excepté Terre-Neuve, et des provinces en reconnaissent d'autres.

Il y a 88 hygiénistes en exercice au Canada. Leur nombre n'a augmenté que de cinq depuis l'année dernière.

The four health services described in Table 9 employ 259 dentists full-time while the federal government employs 226 dentists in the Departments of National Defence, Health and Welfare and Veterans' Affairs.

Les quatre services de santé (tableau 9) utilisent à plein-temps les services de 259 dentistes; le gouvernement fédéral a 226 dentistes dans ses ministères: défense nationale, santé nationale et bien-être social et anciens combattants.

TABLE 7 Certifiable specialties, by province, 1963 • Spécialités reconnues dans les provinces, 1963.

Specialty Spécialité	Total	Province									
		Nfld. T.-N.	P.E.I. I.-P.-E.	N.S. N.-E.	N.B. N.-B.	Que. Qué.	Ont. Ont.	Man. Man.	Sask. Sask.	Alta. Alta.	B.C. C.-B.
Dental public health hygiène dentaire publique	2					v	v				
Oral diagnosis diagnostic	1									v	
Oral surgery chirurgie buccale	9		v	v	v	v	v	v	v	v	v
Orthodontics orthodontie	9		v	v	v	v	v	v	v	v	v
Paedodontics pédodontie	4						v	v		v	v
Periodontics périodontie	9		v	v	v	v	v	v	v	v	v
Prosthodontics prothèse	2					v				v	
Restorative dentistry dentisterie opératoire	1									v	
Total	37	0	3	3	3	5	5	4	3	7	4

TABLE 8 Number of practising dental hygienists, 1963 • Nombre des hygiénistes en exercice, 1963.

Province	Number practising En exercice	Province
Newfoundland	0	Terre-Neuve
Prince Edward Island	0	Ile-du-Prince-Edouard
Nova Scotia	8	Nouvelle-Ecosse
New Brunswick	0	Nouveau-Brunswick
Quebec	1	Québec
Ontario	57	Ontario
Manitoba	1	Manitoba
Saskatchewan	6	Saskatchewan
Alberta	7	Alberta
British Columbia	8	Colombie britannique
Canada	88	Canada

TABLE 9 Dentists employed in health services, 1963 • Dentistes employés dans des services de santé, 1963.

Health Service	Total	Province										Service de santé	
		Nfld. T.-N.	P.E.I. I.-P.-E.	N.S. N.-E.	N.B. N.-B.	Que. Qué.	Ont. Ont.	Man. Man.	Sask. Sask.	Alta. Alta.	B.C. C.-B.		
Dental schools													
full-time	64	0	0	6	0	20	15	9	0	14	0	Facultés dentaires	
half-time	42	0	0	0	0	11	9	4	0	18	0	temps complet	
part-time	340	0	0	22	0	100	157	29	0	32	0	temps partiel	
Hospital service													
full-time	54	1	0	3	1	6	19	3	2	9	10	Service hospitalier	
half-time	NA*1	0	1	0	0	NA*1	5	0	0	0	14	temps complet	
School dental													
service													
full-time	92	0	1	1	3	23	33	3	0	0	28	Service scolaire	
half-time	85	0	6	2	1	11	58	5	1	0	1	temps complet	
Public health													
service													
full-time	49	2	1	2	1	12	11	4	1	9	6	Service d'hygiène	
half-time	9	0	0	0	0	0	0	1	0	8	0	publique	
Total													
full-time	259	3	2	12	5	61	78	19	3	32	44	temps complet	
half-time	NA*1	0	7	2	1	NA*1	72	10	1	26	15	temps partiel	

*Not available • Inconnu

TABLE 10 Dentists employed full-time by federal departments, 1963 • Dentistes employés à plein-temps par les Ministères fédéraux, 1963.

Federal Department	Dentists employed Dentistes employés	Ministères fédéraux
National Defence	169	Défense nationale
National Health and Welfare	22	Santé nationale et bien-être social
Veterans Affairs	35	Anciens combattants
Total	226	Total

dentistry in the news

The Association

EXECUTIVE COUNCIL MEETS

Incorporation of the proposed Royal College of Dentists of Canada, membership of the Canadian Dental Association in the Canadian Council on Hospital Accreditation, and measures to promote the development of dental service corporations and prepaid dental service plans were among the important items discussed by the Executive Council which met at Association headquarters in Toronto, February 11-14. In attendance were president M. V. J. Keenan, J. Zimmerman, W. Miller, R. Langlois, J. P. Coupland, P. S. Christie, W. J. Riley, G. M. Dewis (treasurer), D. W. Gullett (secretary), as well as other association staff members.

The Council authorized the Association to give financial support to the incorporation of a Royal College of Dentists of Canada, an agency to regulate the qualifications and recognition of dental specialists on a national basis.

An application for membership in the Canadian Council on Hospital Accreditation was also authorized by the Council. This would successfully conclude the efforts of the Association's Hospital Services Committee to elevate the status of dental services and personnel in Canadian hospitals. At the same time the Council on Education was requested to study ways and means of increasing hospital dental service training in Canadian dental schools.

Adopting the concept of provincial fee schedules as a basis for negotiation with the Department of Veterans Affairs, the Council urged each of the Association's ten corporate members to establish a definite provincial fee schedule at the earliest possible moment. At the same time, strong support was given to the concept of establishing provincial dental service corporations to administer dental service plans.

Other actions or recommendations of the Council included: support for the principle of regional organizations within the Fédération Dentaire Internationale; representation of federal dental services on the Board of

Governors; intention to publish a monograph entitled "A study of group practice in dentistry" (prepared under the auspices of the Dental Services Committee); a grant to the Canadian Dental Nurses and Assistants Association; and approval of the Association's budget for 1964.

Additional support for the Canadian Fund for Dental Education was reflected in the allocation of a further grant of \$5,000 from the Association's 1964 budget.

The Council gave careful consideration to reports on the Association's pension and insurance plans presented by the plan administrator and by the Wyatt Company, an independent actuarial firm retained for the purpose of making a comparative survey of the operation, premiums and benefits of C.D.A. and other plans. It was concluded that the C.D.A. plans were well established and properly administered and that they compared favourably with other plans.

CANADIAN HIGH NEWS FEATURES DENTISTRY

Dentistry was featured, for the sixth year, in the March Careers Annual of *Canadian High News*, a weekly newspaper which reaches high school students all across Canada. This year's page was sponsored by the National Recruitment Committee of the Canadian Dental Association.

Last year's dentistry page in *Canadian High News* resulted in 500 inquiries from students wanting more information about dental careers. There was a noticeable increase in requests for information about a career as a dental hygienist. All coupons returned from the dentistry page are answered with literature from Canadian Dental Association headquarters and then referred to provincial recruitment committees for follow-up.

COUNCIL ON PUBLIC HEALTH MEETS

Undergraduate instruction in dental public health at Canadian dental schools, administration of government dental services and

employment of salaried dentists were among the important items discussed by the Council on Public Health which met at Association headquarters in Toronto, February 20-21, 1963. In attendance were A. R. S. Gray, C. A. E. McCabe, B. J. O'Meara, K. F. Pownall, and F. McCombie (chairman). Also attending parts of the meeting were H. K. Brown of the Department of National Health and Welfare; R. A. Connor of the Manitoba provincial health department; F. A. Kohli of the Ontario provincial health department; H. Tourigny of the Quebec Ministry of Health; Col. E. C. Purdy of the Royal Canadian Dental Corps; G. T. Mitton of the Faculty of Dentistry, University of Toronto; J. A. Langmaid, B. Levin and R. B. Ross of the Canadian Society of Orthodontists; and D. L. Rife of the Canadian Society of Dentistry for Children.

NEW FILM AVAILABLE

"Challenge of Dentistry," an excellent new film suitable for teenagers and their parents is available for showing in Canada. The film has already been seen by thousands of Canadians at career days and on television.

The film was produced in 1962 for the American Association of Dental Schools and the American Dental Association. It tells the dramatic story of young Jim Reynolds, the "boy down the street" who thinks of dentistry only as "fixing teeth"—until he sees his family dentist on television being honored for helping to save a patient's life.

"Challenge of Dentistry" is available free on loan through the Canadian Dental Association or directly from the appointed distributor, Modern Talking Picture Service, 140 Merton Street, Toronto 7, Ontario.

Public Health

FLUORIDATION GAINS IN NORTHERN ONTARIO

Another Ontario community has been added to the list of those fluoridating their water supplies. Dryden, in Northern Ontario, commenced to fluoridate its water on January 5 of this year. Several years ago Dryden voters approved fluoridation of the town's water supply in a referendum. The present action stems from enabling legislation passed

by the Ontario legislature last year which enables towns to fluoridate their water supply at the decision of local councils.

Dental Organizations

C.D.A. PRESIDENT AND SECRETARY VISIT CENTRAL ALBERTA DENTISTS

March 1 marked the first visit ever of a Canadian Dental Association president and secretary to the Central Alberta Dental Society. Accompanying president M. V. J. Keenan and secretary D. W. Gullett to the meeting at Red Deer was James Zimmerman, Alberta's representative on the Board of Governors and president-elect of the Canadian Dental Association. Presiding over the meeting was J. M. Semple of Rocky Mountain House, president of the Central Alberta Dental Society.

Dr. Keenan reviewed the organization, structure and functions of the Board of Governors while Dr. Gullett commented on impending changes in the practice of dentistry.

"Dentists, whose training has been largely determined by such exact sciences as physics and chemistry, are not well oriented to use the less precise social and political sciences which will shape the ultimate course of dentistry," Dr. Gullett stated. He reminded those who feel that the profession is in the midst of a time of crisis that crisis is composed of two parts—danger and opportunity. "Certainly we must be aware of the dangers, but we must not let this preoccupation prevent our seizing concomitant opportunities. When we decry the marked increase in public interest in dentistry over the past decade, we are prone to brand it as meddling, or view it with suspicion for other reasons. We must remember, however, that this very interest has been responsible for the recent availability of funds for dental education, dental schools, and research programs," Dr. Gullett explained.

EDMONTON DENTISTS ACTIVE

The presentation of an honorary life membership to H. N. Knight was a highlight of the January meeting of the Edmonton and District Dental Society. Dr. Knight, who was

born in Sault Ste. Marie, Ontario and graduated from the University of Toronto in 1922, has practised dentistry in Edmonton for forty years. A clinician and author of several articles on denture construction, Dr. Knight is president of the City Prosthodontic Study Club and a past president of the Edmonton and District Dental Society.

The guest speaker at the January meeting was Mr. Basil Dean, the noted newspaper correspondent.

R. E. McDonald, chairman of the Paedodontic Department of the University of Indiana and immediate past president of the American Society of Dentistry for Children, was the guest clinician at the February meeting. Dr. McDonald discussed space maintenance and operative procedures in conjunction with the rubber dam. He also dealt with the use of fluorides. Later that same day Dr. McDonald reviewed the entire field of pulp therapy, including the various methods of pulp capping and endodontic procedures for deciduous teeth.

Canadian Dental Association president M. V. J. Keenan and secretary D. W. Gullett

were present at the March meeting. Dr. Keenan devoted his comments to the Board of Governors of the Canadian Dental Association. Dr. Gullett spoke on methods of administration and payment in connection with dental health services.

Recently admitted as members of the society were M. Stelioff, R. C. Dawson and J. Sperber.

NEW BOOKLET "LE CHIRURGIEN-DENTISTE" PUBLISHED

A handsome new booklet to be used in recruiting has been published by the College of Dental Surgeons of the Province of Quebec. Entitled *Le Chirurgien-Dentiste*, the 20-page brochure is beautifully illustrated with photographs and drawings. Only the French-language edition is available but an English version is planned. This new publication should serve a useful purpose among French-speaking students, particularly in Quebec.

book reviews

DENTAL AESTHETICS

J. H. Lee. Bristol, John Wright & Sons Ltd., 1962. (Available from the Macmillan Co. of Canada Ltd., Toronto) 159p. Illus. \$9.00

The author presents a concise, practical and well illustrated book for the general practitioner. Although much has been written recently on dental aesthetics, the author approaches the subject more from an analytical point of view than most writers.

A sense of aesthetics is difficult to impart and experience is also a primary requisite. However, the study of aesthetics is made easier when all the elements of the subject are scrutinized separately and their role in the composite picture is properly evaluated.

This the author does rather well. He leads us through the subject step by step and we begin to appreciate each aspect. For instance, he discusses not only colour of the teeth but also of the skin, and how teeth and skin

should blend together. Lightness and darkness, both of faces and teeth, are also placed in their proper perspective, quite apart from the colour. In fact, virtually every subject concerning aesthetics is not only discussed but minutely broken down, including the arrangement, proportions and positions of teeth, both individually and collectively.

One area where aesthetics is very much involved is that of the facial muscles, particularly those of the lips and surrounding structures. Not only are the desired contours of the lips discussed, but the placement of the teeth to achieve these contours is also ably demonstrated. This reviewer feels that this subject is of extreme importance. Usually, it is dealt with in a cursory fashion in most of the text books.

If any objection can be found, it is in the difficulty of fulfilling some of the suggestions outlined in the book. The author, for example, explains how the proportions of each part of a tooth are derived by studying separate areas of the face. He even formu-

lates the proper prescription for the desired tooth. This reviewer finds this information difficult to fulfil. Nevertheless, the information is of great assistance in the selection of teeth from a variety of mould guides.

The book makes easy reading and although compact, is brimming with valuable information. It is definitely an asset to dentistry.

C. H. Moses

THE NATURE OF BIOCHEMISTRY

Ernest Baldwin, Cambridge, University Press, 1962. (Available from the Macmillan Co. of Canada Ltd.) 111 p. \$1.45 (clothbound edition \$2.30)

To students of Biochemistry, the name Baldwin is associated with a lucid, interesting and highly readable book called *Dynamics of Biochemistry*. Baldwin, in a new book, *The Nature of Biochemistry*, has set out to provide potential students in the biological sciences with a fascinating preview of what biochemistry has in store as a field of major study. This book, as stated by the author, is intended "to be read, not studied," and is neither a supplementary nor complementary treatise.

In just over one hundred pages, the reader is introduced to the subject of chemicals from which living material is made and also the major "chemical operations that underlie the manifestations and maintenance of life." The reader is introduced to the mechanisms by which enzymes, the biological catalysts, degrade food, and how the energy from food is captured and stored by cells. In the last chapter, the reader is exposed briefly to new and exciting territories that are now being explored — those dealing with the structure of genetic material (DNA), the mechanism by which genetic material controls the synthesis of proteins, and the explanation on a molecular level of inborn errors of metabolism such as albinism and imbecilitas phenylpyruvica.

Because the book is short, the author was highly restricted in the selection of material to be covered. Therefore, important areas such as nutrition, the mechanism of action of vitamins and hormones have been omitted.

To the prospective student of biology or chemistry who wishes a glimpse of things to come, this book is highly recommended. To the hard-pressed practitioners of dentistry or medicine, this book provides a refresher course in a field that explores the "innermost molecular territory of life itself."

G. Nikiforuk

conventions

Atlantic Provinces Dental Convention in Fredericton June 30-July 3, 1963

The Atlantic Provinces Dental Convention will be held this year at the Beaverbrook Hotel in Fredericton, New Brunswick from June 30 to July 3, 1963. Included in the program are the following essayists

J. L. BERTRAND: Orthodontics
DONALD KEFRON: Prosthodontics
D. B. McADAM: Operative dentistry
J. J. McCARTHY: Oral surgery
JAMES SIM: Periodontics

Also featured will be table clinics as well as a large group of exhibits. The social program offers entertainment for the whole family. Further information may be obtained from W. B. O'Brien, general chairman, 206 Rookwood Avenue, Fredericton, New Brunswick.

announcements

CONVENTIONS OF THE CANADIAN DENTAL ASSOCIATION

1964	Edmonton, Alberta	June 28-July 1
1965	Quebec City, P. Quebec	May 30-June 2

FUTURE EVENTS

<i>Date</i>	<i>Function</i>	<i>Location</i>	<i>Officer</i>	<i>Address</i>
June 9-12, 1963	Western Canada Dental Society	Marlborough Hotel, Winnipeg	Dr. J. P. Beattie	435 Academy Road, Winnipeg 9, Man.
June 30-July 3, 1963	Atlantic Provinces Dental Convention	Fredericton, New Brunswick	Dr. K. A. Hetherington	98 York Street, Fredericton, N.B.
July 1-7, 1963	Fédération Dentaire Internationale	Stockholm, Sweden	Dr. T. Telander	Nybrogatan 53, Stockholm C, Sweden
July 7-12, 1963	Int'l Conference on Functional Jaw Orthopaedics	Buenos Aires, Argentina	Dr. R. S. Bado	Circulo Argentino de Odontologia Directorio 1824, Buenos Aires, Argentina
July 22-26, 1963	British Dental Association	Oxford, England	Dr. J. N. Peacock	13 Hill Street, London W. 1, England
Oct. 14-17, 1963	American Dental Association	Atlantic City, New Jersey	Dr. H. Hillenbrand	222 East Superior Street, Chicago 11, Illinois
Oct. 17-20, 1963	Austrian "Dentisten" Congress	City Hall, Vienna		11 Kohlmarkt, Vienna 1, Austria
Nov. 17-22, 1963	VIIth Mexican Dental Congress	Mexico City, Mexico	Dr. R. Sanchez-Woodworth	Sinaloa No. 9, México 7, D.F., Mexico
25 nov.-1 déc., 1963	XXXVIIes Journées Dentaires Internationales de Paris	Maison de la Chimie, Paris	M. Henri Huguet	33 ave Pierre 1er de Serbie, Paris 16e, France

POSTGRADUATE AND REFRESHER COURSES (U. S.)

COLUMBIA — July 8-12, 1963 — Preventive Orthodontics

COLUMBIA — July 15-19, 1963 — Extraoral Force Therapy

COLUMBIA — September 29-October 1, 1963 — The Biology of Orthodontic Practice

Note • Due to lack of space the Journal cannot accommodate all announcements of foreign dental meetings and postgraduate and refresher courses. Readers are invited to write to C.D.A. headquarters for information concerning unlisted meetings and courses. Further information concerning listed meetings and courses should be sought from the sponsoring institution.

L'Association Dentaire Canadienne

Volume 29

Numéro 5

mai 1963

JOURNAL

The Canadian Dental Association

Evolution actuelle de l'enseignement de la périodontie: 1

par A. S. Wainberg, B.Sc., D.D.S. et M. M. Dines,* B.Sc., D.D.S.,
Montréal, P. Qué.*

Depuis quelques années, nous avons assisté à des changements considérables dans le domaine de l'exercice, de l'enseignement et de la recherche dentaires. Des progrès marqués dans l'art de la restauration et de l'esthétique ont, au début, reporté au second plan l'étude des tissus de support de la dent. Aujourd'hui, l'importance accrue accordée à la biologie de la cavité buccale transforme complètement notre profession. L'art dentaire devient

maintenant une science qui se propose de conserver la santé et l'intégrité de la bouche et des structures connexes. Au début, la périodontie n'était qu'une portion du traitement dentaire; aujourd'hui, nous devons admettre qu'en fin de compte on juge le succès ou la faillite de presque tout traitement d'après la réaction des tissus périodontaires. La périodontie est la base même de tout traitement dentaire moderne.

De récents apports de la recherche, de même que la mise au point de nombreuses techniques nouvelles, créent pour le professeur des responsabilités plus grandes et

Ceci est la première tranche d'un article en deux parties. La deuxième tranche apparaîtra dans une autre livraison du Journal.

*Du département de Périodontie de la Faculté de chirurgie dentaire de l'Université de Montréal.

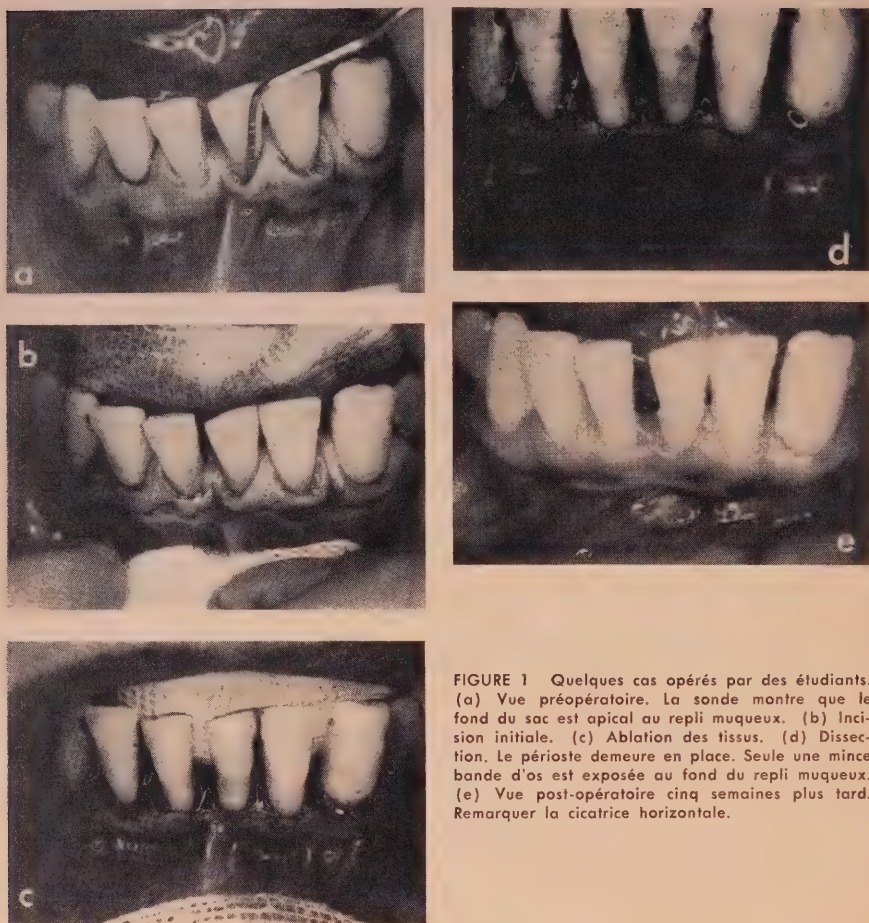


FIGURE 1 Quelques cas opérés par des étudiants. (a) Vue préopératoire. La sonde montre que le fond du sac est apical au repli muqueux. (b) Incision initiale. (c) Ablation des tissus. (d) Dissection. Le périoste demeure en place. Seule une mince bande d'os est exposée au fond du repli muqueux. (e) Vue post-opératoire cinq semaines plus tard. Remarquer la cicatrice horizontale.

élargissent le champ de son activité. Le diagnostic et la chirurgie périodentaire, l'occlusion, l'hygiène publique et la médecine buccale sont des sujets que l'on ne peut plus inscrire qu'au curriculum des cours post-gradués. Ils constituent la base même de l'exercice de notre profession. Il faut les connaître aussi bien que les techniques nécessaires à la restauration d'une carie ou à la confection d'une prothèse. Ce n'est pas une utopie que de vouloir faire le pont entre les sciences de base,

la périodontie et les techniques de restauration. Au contraire, cette intégration constitue l'essence même de l'exercice dentaire d'aujourd'hui.

C'est sans contredit aux écoles dentaires qu'il revient de déterminer la philosophie et l'évolution de l'exercice clinique. Dans ce premier article, nous essaierons d'exposer quelques-uns des moyens que prend l'Université de Montréal pour faire face à ses responsabilités dans le domaine de l'enseignement dentaire. Nous traiterons

exclusivement ici du curriculum sous-gradué ou prédoctoral.

Pour se conformer aux recommandations de la "Commission d'enquête sur la chirurgie dentaire,"¹ l'on a établi un plan qui se propose de donner à l'étudiant qui terminera ses études en 1967 des connaissances de périodontie égales à celles que possède le spécialiste d'aujourd'hui. Le programme d'éducation post-doctorale que l'on est à mettre sur pied actuellement devrait nous fournir les moyens nécessaires pour maintenir les connaissances générales de la profession à un niveau des plus élevés.

CURRICULUM SOUS-GRADUÉ — SECTION DE PÉRIODONTIE

Pour faire comprendre à l'étudiant qu'il travaillera sur un être vivant, nous croyons qu'il y a lieu de lui faire voir ses premiers patients dès la première année. Ceci dans le but de lui faire réaliser en quoi consiste la santé et la maladie des tissus périodontaires. Cette attitude diffère considérablement de l'habitude adoptée dans le passé d'isoler l'étudiant en laboratoire, pendant les deux premières années de son cours, sans lui faire voir autre chose que des mannequins. Modèles, diapositives et films sont des instruments précieux, mais ils ne nous donnent qu'une mauvaise idée de ce qui existe chez l'être vivant qu'est notre patient. Les séances cliniques sont précédées aussi bien que suivies de cours théoriques durant lesquelles on commente les observations que l'étudiant a pu faire sur son patient. De cette façon, l'entraînement du dentiste commence par l'enseignement de la périodontie.

Réunis en congrès, la plupart des professeurs de périodontie d'Amérique du Nord ont cru bon de réclamer que dix pour cent des heures qui paraissent au curriculum sous-gradué soient affectées à l'étude de la périodontie.² Si l'on veut attribuer autant de temps à la périodontie, il faudra modifier profondément l'ensemble du curriculum.

Il y aurait lieu d'utiliser de façon plus efficace le temps passé au laboratoire. Il faudrait confier au technicien une plus grande partie des travaux techniques en se contentant de faire voir à l'étudiant de quelle façon s'établit la collaboration entre le dentiste et le technicien. On pourrait aussi récupérer plusieurs heures en cessant d'enseigner certaines opérations cliniques désuètes.

Nous croyons qu'il y a lieu d'utiliser au maximum les quatre années actuelles plutôt que de chercher à prolonger le cours.

Il nous semble indispensable que les sujets suivants apparaissent au curriculum sous-gradué:

Diagnostic.—La prise de l'histoire de cas en est la première étape. Il faut apprendre à l'étudiant à considérer l'ensemble du patient à l'aide des renseignements ainsi obtenus.

L'examen clinique qui constitue la seconde phase du diagnostic doit se faire systématiquement en commençant par l'examen des tissus mous pour finir par la recherche des caries. Nous enseignons à nos étudiants à prendre l'habitude d'explorer méthodiquement les sacs périodontaires avec la sonde et à tenir un dossier qui soit toujours complet et à date.

C'est à partir de l'histoire de cas et de l'examen clinique que l'on élabore un plan de traitement devant répondre à l'ensemble des besoins du patient; santé, esthétique, fonction et tension psychologiques doivent entrer en ligne de compte. Ce plan de traitement ne s'en tient pas au traitement périodontaire proprement dit, mais jette les bases d'un traitement complet. Il n'est pas rare de consulter les autres départements afin d'obtenir l'opinion de tous les services qui collaborent au traitement du patient. De cette façon, l'on expose à l'étudiant un ou plusieurs plans d'ensemble en réduisant au minimum le risque des contradictions subséquentes.

Traitement.—D'après Glickman,³ on peut diviser le traitement périodontaire comme suit:

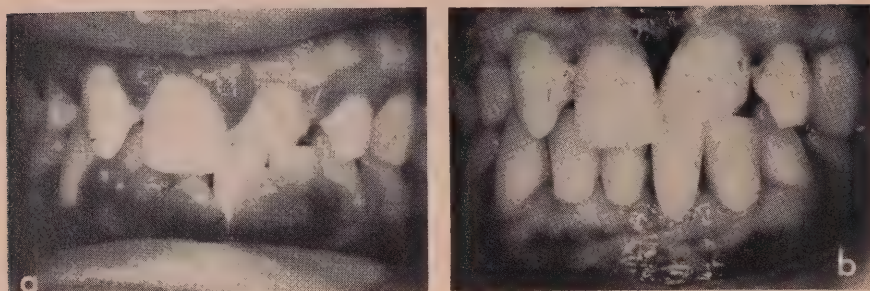


FIGURE 2 Hyperplasie gingivale lors de la grossesse. (a) Vue préopératoire. Hyperplasie considérable. (b) Vue post-opératoire. A gauche: trois semaines après une gingivectomie et frénectomie. A droite: quatre semaines après chirurgie muco-gingivale avec scarification.

- A—Tissus mous
- B—Fonction
- C—Aspects constitutionnels
- D—Entretien

L'opération la plus importante au chapitre des tissus mous est le détartrage. Il faut l'enseigner à l'étudiant dès le début de ses études et insister sur le soin à y apporter. L'usage des instruments, leur entretien et leur aiguisage s'apprennent facilement dès le début du cours.

Il ne faut jamais séparer de l'enseignement du détartrage l'enseignement des méthodes d'hygiène buccale et des techniques auxquelles le patient doit recourir pour maintenir l'intégrité de ses tissus mous.

Occlusion.—C'est en première année que l'on commence à enseigner les principes et les techniques d'ajustements occlusaux. On développe ensuite ce sujet pendant quatre ans.

Nous enseignons une technique de correction fiable et simple qui s'adapte spécialement bien aux problèmes de la denture naturelle. Il s'agit de la technique de Jankelson⁴ que nous avons quelque peu modifiée.

Chirurgie périodentaire.—C'est en première année que l'on enseigne les principes dans des cours et des démonstrations. Dès la troisième année, l'étudiant pourra pra-

tiquer lui-même sur patients toutes ces techniques.

Curettage.—C'est la première méthode chirurgicale qui soit enseignée à l'étudiant. Par le passé, on a trop souvent confondu détartrage et curettage ne faisant ainsi qu'un curettage incomplet au dépens des résultats thérapeutiques. Notre enseignement définit le curettage comme une opération bien distincte que l'on doit faire sans anesthésie locale après avoir bien détartré. Il faut curetter avec des curettes parfaitement tranchantes dans le but bien précis d'enlever la paroi interne du sac périodentaire de même que l'attachement épithélial.

Gingivectomie.—L'on insiste sur l'élimination des sacs et la préparation méticuleuse des racines indispensables à une bonne guérison. Nos cliniciens doivent évidemment être en mesure d'aider l'étudiant lorsque le cas le requiert, en plus d'une gingivectomie, des opérations plus délicates telles que de la chirurgie muco-gingivale ou le traitement de sacs intra-osseux.

La technique du "lambeau" est aussi enseignée à tous les étudiants. C'est une technique des plus utiles permettant de traiter des sacs intra-osseux complexes ou d'autres problèmes inaccoutumés. Enfin, c'est en quatrième année que l'on présen-

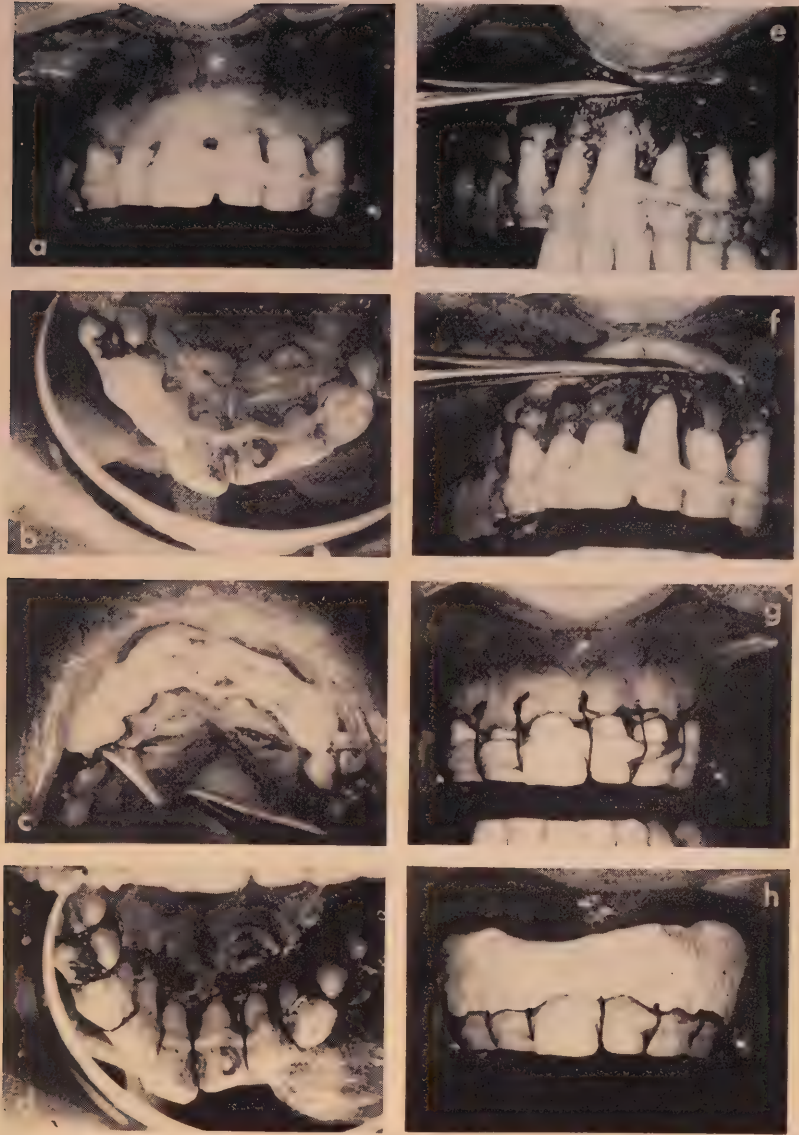


FIGURE 3 Résorption osseuse profonde et irrégulière au maxillaire supérieur. (a) Préopératoire. Atelle de fil d'acier recouvert de résine. (b) Préopératoire. Vue linguale. (c) Incision palatine pour gingivectomie. (d) Le tissu palatin a été enlevé. (e) Le flap du côté labial. On a incisé aux canines. Noter le tartre et le tissu de granulation. (f) Après le détartrage et le polissage des racines. (g) Le flap est remplacé. (h) Le ciment chirurgical est en place.

tera les techniques plus élaborées telles que les greffes.

Le complexe diagnostic-plan du traitement trait'd'union thérapeutique est conçu de façon à donner au patient les meilleurs soins dentaires possibles. Bien que nous n'ayons touché qu'au traitement périodontaire, nous nous empressons d'ajouter que la périodontie n'est pas un chapitre à part de la dentisterie. C'est au contraire la fondation même sur laquelle repose l'art dentaire moderne. Nous expliquons de façon répétée l'interrelation qui existe entre la périodontie et la dentisterie opératoire, la prothèse et l'orthodontie durant le stage de l'étudiant au département de périodontie.

Pour mettre en œuvre un tel programme, il faut avoir recours à des méthodes d'enseignement modernes. Un comité d'études¹, présidé par le Dr Frank E. Beube, recommande les moyens suivants:

(a) Seminars.—Ils ne sont utiles que dans la mesure où tous les membres possèdent une bonne préparation et peuvent offrir une contribution valable.

(b) Démonstrations.—Opérer devant les étudiants est utile; cependant tous ne sont pas en mesure de bien voir le détail de l'opération ou de la démonstration. La télévision en circuit fermé augmente de beaucoup l'efficacité d'une démonstration clinique. Elle a le désavantage de compliquer le travail de l'opérateur qui doit satisfaire à de nombreuses exigences techniques.

(c) Conférenciers invités. — Ceux-ci viendront souvent traiter des sujets ordinaires de façon originale brisant ainsi la monotonie.

(d) Visites.—La visite périodique de cabinets privés intéresse habituellement l'étudiant. Bien préparées, ces visites peuvent être très profitables.

(e) La lecture.—La lecture avertie d'articles et la préparation de mémoires constituent une partie intégrale de l'enseignement. Les lectures dirigées permettront à l'étudiant de se familiariser avec la bibliothèque de même qu'avec les périodiques qui traitent des récents pro-

grès de la médecine et de la chirurgie dentaire. Si l'on se donne la peine de les bien corriger, les mémoires devraient développer chez l'étudiant le sens de la critique constructive.

(f) En groupant deux par deux les étudiants, l'on obtient une utilisation plus efficace du personnel enseignant et les heures de clinique.

Enfin puisqu'il est vrai que l'étudiant ne travaille bien que sous l'effet d'une motivation bien précise, nous croyons qu'il est nécessaire d'exiger de lui un minimum de travail clinique et de lui attribuer des points. Il ne faut cependant pas exagérer l'importance de ces quotas. La préoccupation du quota et des notes peut trop facilement détruire l'attitude professionnelle que l'on a par ailleurs développée avec tant de soin. L'étudiant ne devrait jamais se trouver dans l'obligation de délaisser un cas intéressant faute d'avoir obtenu son minimum dans un autre service.

Il faut évaluer la valeur de l'étudiant de façon périodique, au cours de l'année, de façon à la stimuler et à l'aider à donner le meilleur de lui-même.

La nature de l'examen détermine en grande partie les qualités que développera l'étudiant. L'examen écrit ou oral lui apprend à reconnaître les notions théoriques essentielles; les épreuves cliniques développent la dextérité manuelle; les épreuves objectives développent la concentration et l'attention apportée au détail. L'emploi de toutes ses formes d'exams, dans les proportions voulues, est nécessaire, si l'on veut développer toutes les qualités désirables chez l'étudiant.

L'examen final doit être de nature compréhensive pour réussir à évaluer la façon dont le sujet parvient à coordonner ce qu'il a appris dans les divers départements.

L'étudiant doit aussi comprendre, qu'en tant que membre de la profession, il doit satisfaire à de très hauts standards d'éthique et de compétence. On pourra développer cette attitude en traitant l'étudiant avec délicatesse et considération et en lui accordant le titre de "docteur" devant le

patient. C'est ce que nous faisons de façon délibérée à la clinique. Le patient qui espère être traité de façon compétente s'en trouve rassuré.

RÉSUMÉ

Dans ce premier article intitulé "Evolution actuelle de l'enseignement de la périodontie," nous avons discuté du curriculum sous-gradué et de méthodes d'enseignement. Nous recommandons de commencer très tôt l'enseignement clinique suivant un plan sage et bien établi. Notre but est d'aider à la formation de professionnels habiles et dignes de respect.

SUMMARY

This is the first of two articles dealing with current trends in the teaching of periodontics. In this article the authors discuss the undergraduate curriculum in periodontics at the Université de Montréal. They describe several recently adopted innovations as a result of which students graduating in 1967 will be trained to the level of the present-day periodontist.

Several radical changes have been effected in the curriculum. Instead of being cloistered in a laboratory during the first two years of the undergraduate course, the student now meets his first patient during the first dental year. He begins by

learning the principles of history taking, clinical examination and formulating a diagnosis. Simultaneously, he learns to perform a meticulous prophylaxis and to give adequate home care instructions to his patient. The principles of occlusal adjustment and periodontal surgery are also introduced during the first dental year. Clinical experience in periodontal surgery begins in the third dental year. Curettage, gingivectomy, flap operations and grafting procedures are gradually introduced as the student progresses into the third and fourth years of his course.

By interrelating periodontal treatment with all the other aspects of patient care, the teaching program at the Université de Montréal stresses the biological concept in dental care for the total patient.

The concluding article in this series will deal with postgraduate and graduate education, the training of dental hygienists, and with the public health aspects of periodontal disease.

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Complications d'anesthésie générale

par Jean-Paul Méthot,* M.D., C.S.P.Q., Montréal, P.Qué.

L'anesthésie par inhalation, qu'elle soit donnée chez le dentiste ou à l'hôpital, ne se fait pas sans comporter certains risques, voire même certains accidents, qui malheureusement peuvent être fatals. A l'époque où le chloroforme était l'anesthésique d'usage courant, il n'était pas rare de se trouver en face de fibrillations ventriculaires et d'arrêts cardiaques. Aujourd'hui, avec les techniques modernes et des anesthésiques plus perfectionnés, la sécurité est beaucoup plus grande. Il est bon de se rappeler certains faits, de revoir les notions d'anesthésie, c'est-à-dire de se remémorer ce qui arrive au cours d'une intervention et les moyens à prendre pour éviter ces troubles fâcheux afin de rendre service le plus possible au patient.

Les anesthésistes qui aident le dentiste, à son cabinet, sont hautement qualifiés, connaissent les dangers et les risques de leur spécialité et, de ce fait, les patients sont en sécurité. Ils ne travaillent pas dans le climat hospitalier où on leur présente à la salle d'opération un patient qui a été examiné, préparé, qui a un dossier complet, comportant examen de laboratoire, électrocardiogramme, radiographie pulmonaire, etc; chez le dentiste, ils n'ont pas ces instruments électroniques qui permettent de connaître l'état du cœur au cours de l'anesthésie, de déceler un arrêt cardiaque; ils ne disposent pas d'instrument pouvant arrêter une fibrillation cardiaque, ils ne peuvent pas utiliser l'arsenal thérapeutique dont ils auraient parfois besoin parce qu'ils ne peuvent pas tout transporter avec eux; ils n'ont pas à leur dis-

position de salle de recouvrement équipée à la moderne. Ils arrivent au cabinet du dentiste, face à un inconnu; quel est l'état de son cœur? de ses poumons? de ses reins? Fait-il du diabète? Ils n'ont qu'un stéthoscope et un sphygmomanomètre pour les guider dans l'évaluation physique du malade (s'en servent-ils toujours?); dans cette ambiance, ils précipitent le patient dans l'inconscience.

Fort heureusement, la chirurgie dentaire et buccale n'est pas tellement douloureuse et ne suscite pas le réveil de certains reflexes qui doivent être inhibés dans la chirurgie abdominale et qui sont la cause de maints accidents, surtout d'ordre cardiovasculaire. Chez le dentiste, les anesthésistes n'ont pas à donner généralement une anesthésie très profonde et, ce qui facilite un peu la chose, c'est que les interventions sont de courte durée.

MATÉRIEL

Pour prévenir un accident, l'anesthésiste doit avoir dans sa trousse les objets et instruments suivants:

1. une machine à donner l'anesthésie, avec oxygène et anesthésiques de son choix
2. ballons de réserve
3. aspirateur: soit électrique ou à l'eau; c'est un des instruments les plus importants
4. sondes aspiratrices
5. ouvre-bouche, tampons
6. tubes endotrachéaux avec ballonnet, si possible
7. laryngoscope
8. tubes oro + naso-pharyngés
9. masques: facial et nasal

Conférence prononcée à la Société dentaire de Montréal, le 21 janvier 1963.

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10. seringues et aiguilles
11. médicaments, parmi lesquels: opiacés, atropine, pentothal, curare, hypertenseurs (méthédrine, vasocyl).

spasme glottique ou laryngé, puis à l'arrêt cardiaque.

VOMISSEMENTS

PRÉMÉDICATION

Il y a trois catégories de patients dentaires:

1. les anxieux parmi lesquels se trouvent les enfants
2. les costauds, les durs, les forts
3. les alcooliques.

Il ne faut pas négliger l'état émotif d'un patient qui, à la suite d'une simple injection de morphine et d'atropine ou de l'ingestion d'un barbiturique quelconque, se présente calme, indifférent.

En effet, la prémédication consiste en une injection d'opiacé, morphine ou demerol, puis d'atropine donnée 1 heure avant l'intervention: la morphine, pour diminuer l'anxiété; l'atropine, pour diminuer la salivation et les sécrétions, puis, réduire les réflexes vagues. La prémédication ne doit jamais se donner de routine, mais doit être individualisée, c'est-à-dire donnée selon le poids et l'âge.

West et Papper nous disent qu'ils préfèrent la scopolamine à l'atropine surtout chez les enfants, à cause de son effet plus marqué sur les sécrétions et de la sédation psychique qu'elle donne.

Les tranquillisants peuvent aussi être d'un précieux secours. Il faut, si on anticipe des ennuis, donner au moins un barbiturique ou un tranquilisant une heure avant l'intervention.

On doit se méfier de ces alcooliques et de ces "durs" qui, sous l'effet de l'anesthésie, peuvent transformer les bureaux en arènes de boxe, en brisant tout dans l'appartement — une simple petite pilule ou injection pourrait faire d'eux des petits moutons bien dociles!

Souvent, l'anesthésiste choisit de donner du Pentothal ou de l'atropine par voie endo-veineuse avant l'intervention: c'est qu'il a remarqué que le patient a un pouls trop lent, sachant que le vagotonique est toujours un danger, porté qu'il est au

On ne saurait trop insister sur l'importance du jeûne: il faut que le patient soit absolument à jeun depuis au moins 4 ou 5 heures. Le principal risque de l'anesthésie chez un dentiste consiste en vomissements, parce qu'ils sont généralement incontrôlables et parce que ces vomissements peuvent provoquer des accidents vraiment sérieux dans l'immédiat ou plus tard. Donc, insister sur le jeûne, c'est de toute première importance.

Mécanisme du vomissement.—Vomir est un acte réflexe contrôlé par un centre médullaire situé près du noyau du vague et du centre respiratoire. Des influx afférents arrivent de n'importe quelle partie du tractus digestif, du cœur, de l'oreille interne ou du cerveau. Au début d'un vomissement, le pyllore se ferme, l'estomac se relâche, devient comprimé contre la paroi abdominale postérieure et les autres viscères abdominaux, comprimé en plus par la descente du diaphragme et la contraction des muscles abdominaux antérieurs. Le cardia s'ouvre et le contenu de l'estomac est expulsé dans l'œsophage, la bouche et le nez. Au début de la période expulsive, il y a spasme de la glotte empêchant le contenu d'entrer dans l'arbre bronchique, mais cette glotte se relâchera et laissera inonder le poumon est c'est là le danger surtout chez un patient inconscient.

Qu'est-ce qui peut causer des vomissements?

1. Certaines personnes vomissent avec la plus grande facilité: en automobile, en bateau, en avion, par dégoût, sous l'influence d'une odeur qui ne leur plaît pas.

2. Certains agents anesthésiques sont dits être émétiques, tels le chlorure d'éthyle, le chloroforme, le cyclopropane, le Pentothal — surtout s'ils sont adminis-

trés sans précaution chez des malades non préparés.

3. L'hypoxie favorise les vomissements.

4. Certains médicaments, tels la morphine.

5. Une stimulation centrale au 2e stage de l'anesthésie, soit à l'induction, soit au réveil.

6. L'irritation de la base de la langue ou du pharynx, soit par l'introduction prématurée d'un tube oro ou naso pharyngé, soit par l'écoulement de sang, les sécrétions, les dents, les particules de dents ou de toute autre substance que nous n'avons pu retenir dans la bouche, faute de tampons suffisants ou de tampons mal placés.

7. Une préparation pré-opératoire inadéquate.

8. Puis, naturellement, un estomac bien rempli, i.e. chez les personnes non à jeun.

Quels sont les dangers des vomissements?

1. Dangers immédiats: L'obstruction des voies respiratoires, bloquant la respiration et invitant l'hypoxie et même l'anoxie et l'arrêt cardiaque si on ne parvient pas au plus tôt à nettoyer la bouche et les voies respiratoires.

2. Dangers à conséquences futures: L'inhalation du contenu gastrique dans les voies bronchiques et pulmonaires peut causer les accidents suivants: pneumonie ou broncho-pneumonie (que nous appelons de déglutition), atéléclasia pulmonaire et abcès pulmonaires.

Que doit-on faire quand nous voyons qu'une personne vomit? — D'abord se hâter de nettoyer la bouche, soit avec un aspirateur (ce qui est l'idéal), soit avec des compresses en se rendant en profondeur. Mettre la tête en bas en basculant le fauteuil (position de Trendelenbourg); discontinuer l'anesthésie, du moins momentanément.

S'il y a lieu de penser à une inondation bronchique, il ne faut pas hésiter; il faut absolument à l'aide d'un aspirateur et d'une sonde aspiratrice nettoyer les bronches. Parfois, pour ce faire, l'anesthésiste est forcé d'introduire un tube

endotrachéal pour l'aider à faire une meilleure toilette bronchique.

LES ACCIDENTS OU TROUBLES RESPIRATOIRES

Mentionnons l'obstruction respiratoire, l'arrêt respiratoire.

Le problème qui se pose ici c'est celui de maintenir un échange d'air convenable en la présence d'une dépression anesthésique.

L'obstruction respiratoire.—Celle-ci doit être évitée pour trois raisons:

1. parce qu'elle empêche les échanges gazeux de se faire;

2. parce qu'elle demande un surcroît d'effort de la part du patient et peut même compromettre sa vie;

3. parce que, les échanges se faisant mal, l'induction se trouve retardée.

Les causes d'une obstruction respiratoire sont les suivantes:

1. obstruction par la langue en ce que celle-ci va s'accoller à la paroi postérieure du pharynx: pour y remédier, il s'agit de relever la mandibule, ou de tirer la langue, puis d'insérer un tube pharyngé si nécessaire.

2. spasme des muscles de la mâchoire: pour y remédier, il s'agit encore de relever la mandibule, d'insérer un tube pharyngé; si on n'y parvient pas, on doit parfois se servir d'un ouvre-bouche ou se servir de curare.

3. obstruction au-dessus de la glotte. Cette obstruction peut être causée par un tampon placé trop profondément, une dent, un corps étranger, du mucus, des vomissements, du sang. Dans tous ces cas, il faut ouvrir la bouche, tirer la langue, aspirer la gorge et oxygéner le patient. L'anesthésiste se voit dans l'obligation de se servir d'un laryngoscope pour vérifier et aussi de faire une intubation endotrachéale.

4. Le laryngospasme: celui-ci peut être le résultat d'une stimulation directe de la muqueuse laryngée ou d'une stimulation réflexe provenant du champ opératoire ou des deux ensemble.

L'inspiration se fait plus difficilement que l'expiration et cause ce qu'on appelle le "stridor laryngé."

La stimulation locale peut être due à un excès de fluide irritant le larynx, du sang, des vomissements, des excès de sécrétions chez de gros fumeurs ou des patients non atropinés ou pas assez, une induction trop rapide, une vapeur trop concentrée, une mise en place trop précoce d'un tube pharyngé. Les stimuli périphériques peuvent causer un spasme du larynx, si l'anesthésie n'est pas assez profonde.

Le spasme devient complètement expiratoire et une cyanose progressive apparaît; l'anoxie qui en résulte augmente le spasme; ce spasme, à son tour, augmente l'anoxie et par conséquent le spasme.

Les anesthésiques, stimulants du parasymphatique, comme le Pentothal ou le cyclopropane, ne doivent pas être employés pour atténuer ce spasme; car, au contraire, ils peuvent l'augmenter en activant le réflexe parasympathique qui l'a peut-être causé.

Le traitement consiste d'abord à éliminer le facteur irritant par la suppression de l'anesthésique et la succion de la gorge. Toute stimulation chirurgicale doit cesser, du moins pour un moment. On donne de l'atropine par voie intraveineuse et peut-être du curare. Puis au moyen du masque et du ballon, de l'oxygène à 100 pour cent est forcé à pénétrer dans le poumon. Si le spasme ne cède pas, on se sert de succinylcholine et on tente l'intubation endotrachéale.

Si l'anesthésiste ne dispose pas du matériel nécessaire, il peut insérer une grosse aiguille à travers la membrane cricothyroïdienne et injecter de l'air ou de l'oxygène au moyen d'une seringue de 20 cc.

La trachéotomie peut être utilisée en cas d'extrême urgence.

L'arrêt respiratoire.—Cet arrêt se produit soit par:

1. l'acapnie (absence de CO₂) produite par l'hyperventilation,

2. une obstruction complète des voies respiratoires,

3. un dosage excessif d'anesthésique,

4. une anesthésie trop légère; ici le malade ne dormant pas suffisamment retient sa respiration.

COMPLICATIONS PULMONAIRES

Il peut y avoir complication pulmonaire

1. par blocage bronchique; soit par accumulation de mucus, conséquence d'une irritation de l'agent, ou des tubes, etc — soit par du sang, des débris, dents ou vomissements, soit par une maladie bronchique préexistante: bronchite, bronchiectasie.

2. par une gêne dans la circulation sanguine pulmonaire; ici on pourrait parler de l'embolie pulmonaire et de l'œdème aigu du poumon.

3. par invasion bactérienne, venant soit des produits aspirés dans les bronches, soit du matériel contaminé ou malpropre (tubes, masque facial).

Et quelles sont ces complications pulmonaires? Mentionnons la bronchite, la pneumonie, la bronchopneumonie, l'atélectasie, l'embolie pulmonaire, l'œdème aigu du poumon et enfin l'abcès pulmonaire.

COMPLICATIONS CARDIO-VASCULAIRES

Avant de pratiquer l'anesthésie, il est d'une grande sécurité en même temps qu'un devoir de placer sur un des bras du patient, un brassard pour pouvoir prendre la tension artérielle le plus souvent possible. Le pouls doit aussi être palpé régulièrement.

D'abord les hypotensions ensuite les défaillances circulatoires, communément appelées syncopes.

Les hypotensions.—Les principales se rencontrent:

1. au cours d'anesthésies trop profondes.

2. après une administration trop forte de Pentothal: surtout chez des patients âgés ou souffrant d'hypertension artérielle ou de toxémie quelconque.

3. l'hypotension par hypoxie: l'accumulation du CO_2 provoque pour un certain temps une augmentation de la tension artérielle; bientôt, il y a diminution pouvant aller jusqu'à une défaillance irréversible.

4. Les hypotensions par perte sanguine.

5. Enfin les hypotensions par stimulation vagale.

Les défaillances circulatoires

(a) Les défaillances circulatoires primaires peuvent être dues: (1) à une fibrillation ventriculaire survenant le plus souvent chez des cœurs irritables, ou (2) puis à un arrêt cardiaque.

(b) Les défaillances circulatoires secondaires sont dues à la conséquence de l'hypoxie sur le myocarde ou à une circulation coronarienne déficiente.

Arrêt cardiaque

Etiologie:

1. Tout agent anesthésique peut causer un arrêt cardiaque, car il peut y avoir un phénomène idiosyncrasique à l'agent lui-même. Le cyclopropane et le chloroforme augmentent l'irritabilité du muscle cardiaque et peuvent provoquer une fibrillation ventriculaire. L'épinéphrine augmente le pouvoir de fibrillation par le cyclopropane et le chloroforme.

2. L'hypoxie: L'oxygène est le besoin no 1 de l'organisme qui ne peut s'en priver au risque de désordres sérieux. Une hypoxie continue mène à l'anoxie. Le 1er organe atteint sera le cortex cérébral, puis les centres vasomoteurs et cérébraux et enfin le muscle cardiaque.

3. Les arrêts cardiaques peuvent survenir par réflexe vago-vagal.

4. Cardiopathie pré-existante chez les cardiaques: le patient atteint d'une maladie du cœur ne supporte pas un manque d'oxygène.

Diagnostic:

Il y a absence de pouls; absence de tension artérielle; les téguments sont blancs-grisâtres.

Ce qu'il faut faire:

1. Allonger le patient en position de Trendelenbourg, la tête basse.

2. Contrôler la respiration avec du 1⁰² à 100%: ici il faut substituer le masque nasal au masque facial pour plus d'efficacité. L'idéal, c'est d'introduire un tube endo-trachéal.

Si par hasard, l'anesthésiste ne dispose pas de l'équipement désiré et que, par malheur, il a épuisé son oxygène, il faut utiliser une méthode bien simple et efficace, celle du bouche à bouche: il suffit de respirer dans la bouche du patient tout en relevant la mandibule afin que la langue n'obstrue pas le passage de l'air.

3. Massage cardiaque. Il n'y a pas si longtemps il fallait ouvrir le thorax pour masser un cœur et, avant de donner le mot d'ordre au chirurgien, l'anesthésiste hésitait parfois trop longtemps. Aujourd'hui, il n'a plus d'excuses car une nouvelle méthode de massage cardiaque s'est avérée efficace; elle ne requiert pas le secours du chirurgien et n'importe qui peut la pratiquer: c'est le massage cardiaque externe.

A cheval sur le malade étendu sur le fauteuil renversé ou sur toute autre surface dure (plancher ou civière), l'opérateur place une main sur le sternum et, à l'aide de son autre main et de son autre bras, il pousse sur sa lère main d'une façon rythmée et ferme, à coups secs et efficaces, afin que le sternum aille appuyer sur le cœur, à un rythme d'au moins 60 par minute; si l'opérateur devient fatigué, il se fait remplacer par un autre, tant que le cœur ne se sera pas remis à battre librement.

Au moindre soupçon d'un arrêt cardiaque, ne pas hésiter à comprimer le sternum sur le cœur; le seul inconvénient qui peut survenir est soit une fracture du sternum ou une fracture d'une ou de plusieurs côtes.

4. Puis l'anesthésiste dispose de médicaments: adrénaline, isuprel, épinéphrine, levophed, aramine, méthédrine, vasosyl, etc. Ces substances sont d'un précieux secours.

LES EXPLOSIONS

L'explosion est l'accident le moins commun, mais le plus dramatique qui soit.

Tous les anesthésiques volatils et gazeux couramment utilisés, à l'exception du protoxyde d'azote, du chloroforme, du fluothane et du penthrane, sont inflammables et les concentrations requises pour l'anesthésie en font des mélanges dangereux.

Le cyclopropane est le plus explosif des anesthésiques et plusieurs hôpitaux aujourd'hui en défendent l'usage.

Les dommages sérieux peuvent être causés au cours d'une explosion entraînant la mort de tout le personnel de la salle d'opération ou le blessant gravement. Le patient étendu sur la table ou dans le fauteuil est fort exposé.

Le matériel peut être endommagé et un incendie se déclarer. Notons que le pourcentage minimum d'oxygène nécessaire par les besoins physiologiques est supérieur à celui qui suffit pour assurer sa combustion.

Les sources d'ignition peuvent être:

1. La chaleur: provenant d'une flamme visible (bec Bunsen), d'un fil chaud, d'une surface chaude, d'une ampoule électrique surchauffée, d'un endoscope ou d'un thermo-cautère.

2. Le courant électrique: engendré par la diathermie, le cautère électrique, une étincelle provenant d'un moteur (aspirateur électrique), un appareil à R-X, un court-circuit ou un commutateur électrique.

3. L'électricité statique: les étincelles provenant de l'électricité statique sont la cause de la majorité des explosions. L'électricité statique est produite quand deux surfaces non semblables viennent en contact ou quand un non-conducteur vient en contact avec un conducteur.

Précautions à prendre pour prévenir une explosion

1. La réalisation de l'iso-électricité dans la salle d'opération pour prévenir l'ac-

cumulation d'électricité statique.

2. L'établissement d'un contact entre l'anesthésiste, le malade et l'appareil par un réseau métallique relié à la terre dans le plancher.

3. Interdiction du port de semelles isolantes, de laine et de soie et nylon par le personnel.

4. Le maintien d'un degré élevé d'hygrométrie de l'air ambiant (qui doit être de 55 à 60 pour cent).

5. L'interdiction de l'usage de flammes et de tout appareil électrique capable de provoquer une étincelle (ceci en présence d'un mélange explosif).

Naturellement, chez le dentiste, il suffira de ne pas fumer et de se servir d'anesthésiques non explosifs.

SUMMARY

The administration of general anaesthetics in the dental office is fraught with greater hazard than in a hospital because the anaesthetist cannot examine the patient as thoroughly and because he does not have at his disposal the equipment which is available in a hospital to treat any complications. On the other hand, the administration of general anaesthesia in the dental office is less difficult because it is generally of shorter duration and because the level of anaesthesia is not as deep as that required for many other types of surgery.

The author lists the instruments which the anaesthetist must have at his disposal in order to deal with complications which may arise in the dental office. He stresses the value of premedication as a means of preventing difficulties during anaesthesia.

The most frequently encountered complications are vomiting, respiratory obstruction, respiratory arrest, circulatory deficiencies, hypoxia, cardiac arrest, and explosions. The author describes the physical phenomena in each of these problems as well as the preventive and corrective measures which the anaesthetist must adopt.

12260 Taylor

Présentation du travail

Pour être un bon dentiste, il faut acquérir l'habileté de faire de nos propres mains un nombre considérable de restaurations pour remettre en fonction l'appareil masticatoire. De plus, il faut avoir appris à évaluer des pathologies de toutes sortes pour pouvoir appliquer les traitements nécessaires.

Mais il nous est difficile d'exercer notre art et d'appliquer notre service dans l'intérêt et le bien-être de notre patient, si nous ne savons pas présenter notre travail.

Il semble que 95 pour cent de nos patients, surtout les nouveaux, ignorent les conditions véritables de leurs dents et la façon dont les arcades dentaires s'articulent. Afin de rendre pleinement service à ceux qui nous font confiance, il est de notre devoir de prendre le temps nécessaire pour les instruire sur l'état de leur bouche. Certes, on doit s'enquérir d'abord directement ou de façon détournée si notre patient est intéressé à garder ses dents et celles de ses dépendants. Nous constatons de plus en plus que les gens désirent véritablement prévenir les troubles d'ordre dentaire et conserver leurs dents. La réclame occasionnelle dans les journaux et à la télévision, l'élévation du niveau d'éducation de nos populations et l'excellent travail fait par les hygiénistes dentaires augmentent sans cesse le nombre de gens qui désirent prendre soin de leurs dents. Mais ces efforts ne porteront leur fruit véritable que si le praticien qui reçoit le patient ne finit pas le travail d'éducation. Les moyens publics d'éducation ne peuvent que couvrir les généralités

et laissent nombre de questions dans la tête de l'individu.

Ainsi, il nous apparaît que le praticien avisé doit posséder et utiliser certains moyens de démonstrations pratiques: modèles d'étude, radiographies, dossier explicatif, photographies, etc. Ce matériel d'éducation m'apparaît tellement nécessaire qu'il devrait maintenant être inclus dans la liste d'achat de tout nouveau diplômé. Le patient doit connaître ce qu'est une carie dentaire, un traitement de canal et l'étendue d'une destruction osseuse. L'illustration de ces facteurs, à elle seule, ne vaut-elle pas "mille mots?" La Ligue d'hygiène dentaire, l'Association dentaire canadienne et certains manufacturiers de matériaux dentaires possèdent tout un arsenal de pamphlets éducatifs conçus spécialement pour aider le dentiste à faire l'éducation de son patient. Combien d'entre nous prennent la peine de lire, d'expliquer et de distribuer cette littérature? Pourtant le public préfère lire des articles se rapportant aux soins des dents plutôt que de feuilleter des revues, dans nos salles d'attente.

Nous voulons tous prendre nos responsabilités. L'habileté technique et les connaissances scientifiques de nos dentistes se comparent en tous points avec ceux d'ailleurs. L'heure est maintenant venue de développer les moyens d'une bonne présentation et de convaincre les gens de la valeur de nos traitements.

Pour que nos relations avec notre public ne se gâtent jamais, établissons clairement nos tarifs avant de commencer un travail. Une fois le prix fixé, respectons-le. Rien

ne brise autant la confiance de nos patients que les changements de nos tarifs pendant l'exécution du travail. Si une situation imprévue se présente et doit influencer l'étendue du traitement et les honoraires, exposons clairement la question aux patients. Mais, après un diagnostic prudemment posé, toutes les éventualités peuvent être facilement exposées

avant de commencer le traitement. Parmi les plaintes que le Collège des chirurgiens dentistes de la province de Québec reçoit figurent en tête de liste: (1) les tarifs mal expliqués; (2) un service rendu sans l'assentiment au préalable du patient ou de son tuteur; (3) la mauvaise tenue du praticien et le service mal rendu.

M.C.

les actualités dentaires

L'Association

TOURNÉE DU PRÉSIDENT DANS L'OUEST DU PAYS

Le président de l'A.D.C., le docteur M. V. J. Keenan, accompagné du secrétaire, le docteur Don W. Gullett, a visité les provinces de l'ouest, en février et en mars derniers. Voici quel a été leur itinéraire: Port Arthur, le 23 février; Winnipeg, le 25 février; Moose Jaw, le 26 février; Saskatoon, le 27 février; Edmonton, le 28 février; Red Deer, le 1er mars; Penticton, le 2 mars; Victoria, le 4 mars; Vancouver, le 5 mars; Calgary, le 7 mars; Sudbury, le 11 mars.

Le Canada

EXPO-SCIENCES

La deuxième Expo-sciences tenue au niveau national a eu lieu à Toronto, au Casa Loma, les 3 et 4 mai derniers. Les patrons de cette exposition de 1963, en collaboration avec le Conseil canadien des Expo-sciences sont les membres du Club Kiwanis de Toronto ouest, qui s'occupent du Casa Loma, l'Association d'agriculture et des professeurs des sciences agricoles d'Ontario et l'Association des professeurs de sciences d'Ontario.

Douze des vingt-deux Expo-sciences qui se sont tenues par tout le Canada au cours de la dernière année académique ont envoyé quarante-cinq finalistes à la première Expo-

sciences qui s'est tenue au niveau national à Ottawa, en mai dernier. Aux Expo-sciences régionales, 78,000 visiteurs ont examiné 1675 projets qui y étaient exposés. Il y eut, à part les exposants qui sont inscrits directement aux expositions régionales, 26 expositions scolaires, dont le nombre d'exhibits variait entre 14 et 280 et ces expositions scolaires ont fourni des participants aux expositions régionales. Le Conseil incite les professeurs, les organismes sociaux, les sociétés professionnelles et les groupements industriels à organiser des Expo-sciences, dans les écoles et dans des régions et, pour ce faire, il fournit des renseignements et aide ces groupes pour leur initiative.

Les finalistes, à l'exposition nationale de Toronto, ont concouru pour des prix d'une importance nationale. Les réalisations les plus remarquables ont été récompensées par des associations professionnelles, scientifiques et éducationnelles (y compris l'Association dentaire canadienne) qui patronisent cette exposition. Les deux grands gagnants de cette seconde Expo-sciences nationale, un garçon et une fille, seront envoyés à la Quinzaine internationale de science juvénile, en Angleterre.

DENTISTE NOMMÉ SÉNATEUR

Le docteur Orville H. Phillips, député fédéral progressiste-conservateur pour l'Île-du-Prince-Édouard, a été nommé sénateur. Cette nomination a été annoncée par le premier ministre Diefenbaker, le 5 février. Le docteur Phillips a obtenu son diplôme de dentiste de l'Université de Dalhousie, en 1952. Il est natif de l'Île-du-Prince-Édouard.

Chronique Internationale

CONGRÈS À STOCKHOLM DE LA FÉDÉRATION DENTAIRE INTERNATIONALE

Les dentistes canadiens sont invités à assister à la 51^e réunion de la Fédération dentaire internationale à Stockholm, Suède, du 29 juin au 6 juillet prochains. Les sujets à l'étude seront les répercussions du marché commun européen sur la profession dentaire, l'aspect biologique de la prothèse dentaire, la microbiologie des maladies périodentaires, la santé dentaire des vieillards et plusieurs autres. Il y aura traduction simultanée en anglais, en français et en allemand. Il y aura plusieurs réunions sociales, y compris une excursion au fameux archipel de Stockholm,

des représentations au théâtre Drottningholm et une visite du musée Wasa, connu dans le monde entier. Les dentistes qui se proposent d'assister au congrès de Stockholm ou à d'autres congrès européens feraient bien de devenir membres supporteurs de la F.D.I. Les membres de la F.D.I. reçoivent le bulletin de la F.D.I., le Journal dentaire international et un certificat de membre qui peut être encadré; ils bénéficient aussi d'une réduction dans les honoraires d'inscription à tous les congrès de la F.D.I. On peut devenir membre à vie moyennant une somme de \$200.00.

On peut s'adresser au secrétariat de l'Association dentaire canadienne pour l'inscription au congrès et pour retenir des chambres d'hôtel; on peut aussi s'adresser directement au comité d'organisation du congrès, 53 Nybrogatan, Stockholm, Suède. On trouve dans cette livraison une formule pour devenir membre de la Fédération.

analyse

PROTHÈSE SUR IMPLANTS ENDO-OSSEUX ET SUR PILIERS NATURELS. PROTHÈSE VEROUILLÉE

Jean Lehmanns. Paris, Maloine, édit., 1963.

L'implantation dentaire endo-osseuse, depuis vingt-cinq ans, a constitué un problème qui a passionné plusieurs chercheurs.

Le livre de Lehmanns, paru récemment, nous donne les résultats favorables obtenus par l'auteur, après cinq années d'expérimentation. C'est un événement considérable dans la pratique odonto-stomatologique.

Lehmanns commence son livre par un rapide historique et un rappel d'anatomie topographique incluant des mensurations de volume des maxillaires. Suit l'exposé du mécanisme de l'ostéogénèse, d'après les données les plus modernes. Les succès de la technique des implants endo-osseux sont basés sur la connaissance et le respect de ces phénomènes. L'implantation est favorisée par les matériaux utilisés, le tantal et les stellites, ainsi que par les antibiotiques. L'auteur a une technique originale d'inclusion, appelée par lui "implant

à arceau." Cette technique est décrite avec force détails.

Les examens radiologiques et cliniques, ainsi que les conseils de prémédication et de postmédication et surtout le choix des cas sont très utiles.

C'est dans les cas d'édentés partiels que la méthode endo-osseuse, d'application aisée et anodine, donne de grandes satisfactions pour solutionner des cas difficiles. L'auteur, au sujet de cas complètement édentés, fait des réserves, conseillant des recherches avec un recul d'au moins cinq années pour pouvoir affirmer des avantages certains sur la prothèse classique. Tout de même, il pense que, dans ces cas, l'implantation endo-osseuse est particulièrement indiquée dans l'hypertrophie des maxillaires, impossible dans l'atrophie extrême et peut-être discutable, pour le moment, dans les cas de résorption maxillaire d'importance moyenne.

Pour tous ceux qui s'intéressent au problème des implants, le livre de Lehmanns apporte vraiment des choses très importantes et une mise au point actuelle. N'oublions pas aussi la bibliographie spéciale, à la fin du livre.

Gérard de Montigny

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Exostoses of the maxilla and mandible are frequent, occurring in about one out of four patients.

They are usually localized, protruding, hard, bony masses of varying shapes and sizes located on the surfaces of jaws. Generally beginning early in life, they grow slowly but with greater activity during the second and third decades of life. Arrest usually occurs when bone maturation has been attained. Exostoses are benign in nature—should not be classified as osteomas and do not transform into malignant neoplasms; hence, are of no particular pathological significance.

Exostoses are found in various sites, for example:

A *torus palatinus* is an exostosis which

projects from the palatal vault at the midline. Radiographically, it appears as a well-rounded, localized radiopacity with distinctive peripheral borders, superimposed over the nasal cavity:

Torus mandibularis, another exostosis, protrudes from the lingual surface of the mandible, in the region of the bicuspid teeth. *Mandibular tori* may be single, multiple, unilateral or bilateral. More often composed of dense cortical bone, they are visualized in radiographs as round or elliptically shaped radiopacities, often obliterating the root outline of overlying teeth.

Occasionally, exostoses are found on the labial or buccal surfaces of the jaws and, more rarely, over the inferior cortex of the mandible.

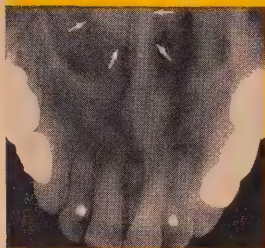


Fig. 1. Occlusal radiograph of a *torus palatinus*.



Fig. 2. Lateral occlusal view of a *torus palatinus*, containing considerable medullary bone.



Fig. 3. Occlusal radiograph of a unilateral, densely radiopaque *torus mandibularis*.

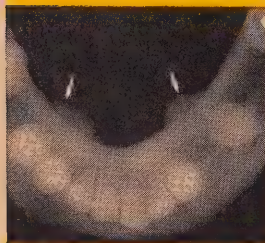


Fig. 4. Occlusal radiograph of bilateral, well-rounded tori.



Fig. 5. Occlusal radiograph of a less densely calcified *torus mandibularis*.



Fig. 6. Occlusal radiograph of a more posteriorly located exostosis.

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Fig. 7. Periapical radiograph of bilateral tori superimposed over roots.



Fig. 8. Periapical radiograph of bilateral, densely radiopaque, more anteriorly located mandibular tori.

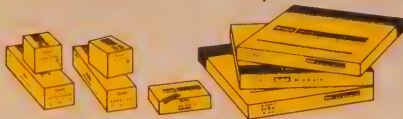


Fig. 9. Extraoral radiograph of exostosis attached to inferior cortex of mandible.

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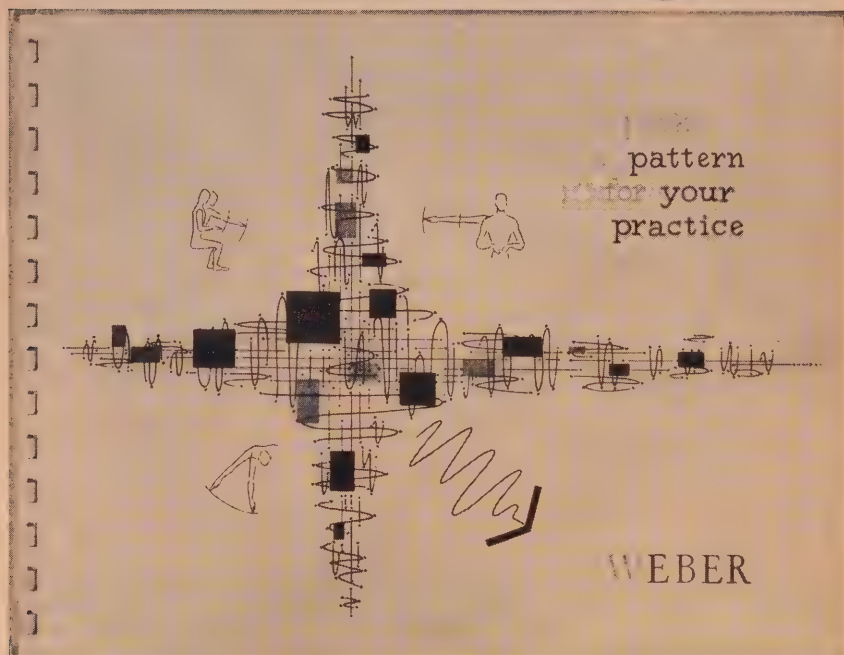


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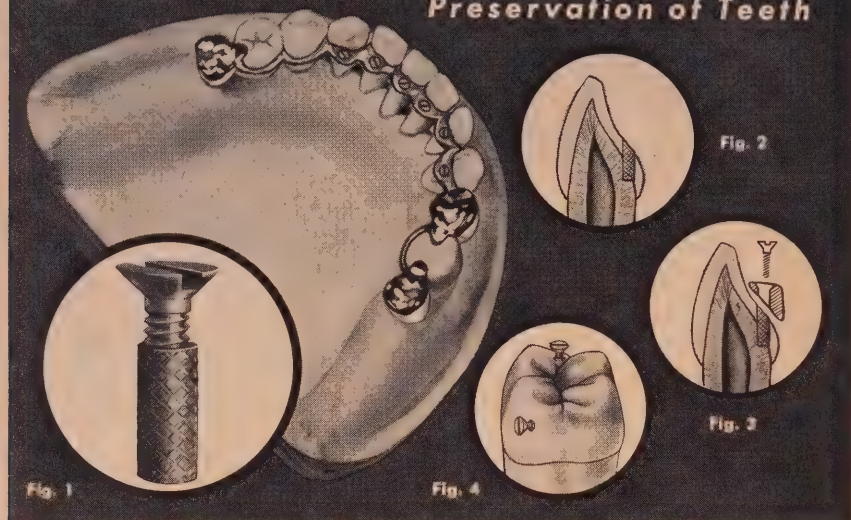
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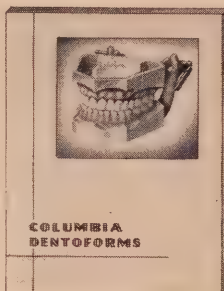
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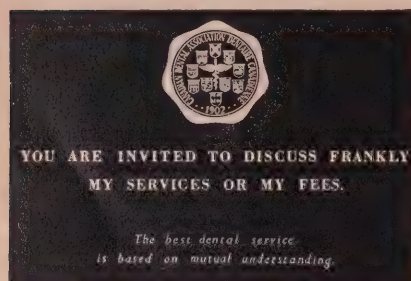
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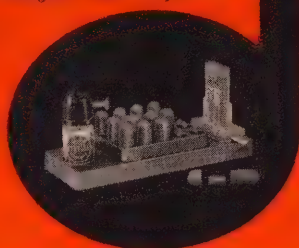


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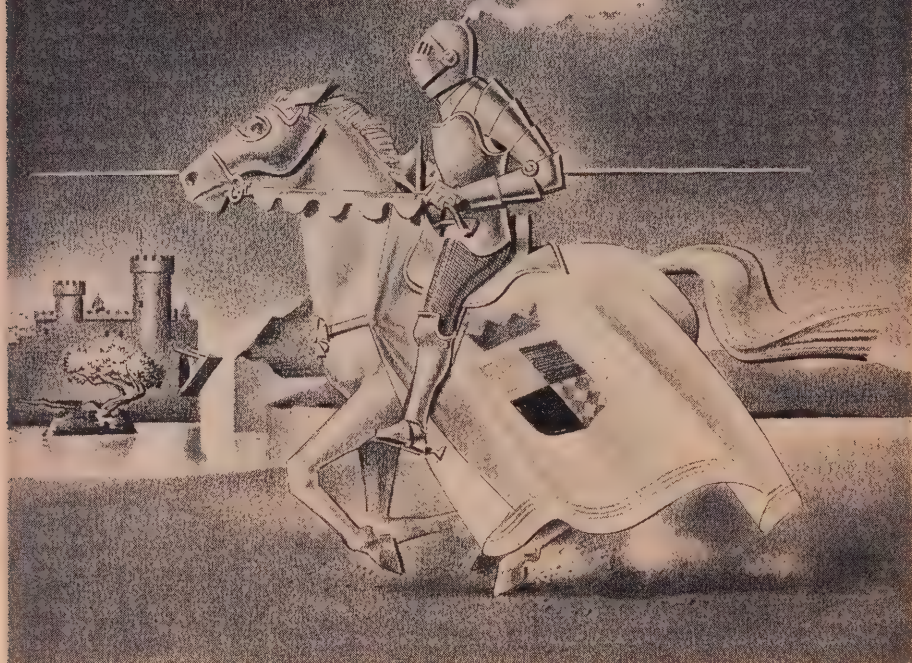
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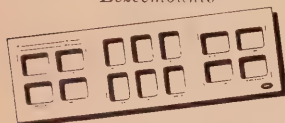
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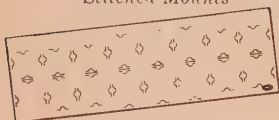
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L'Association Dentaire Canadienne

JUNE

1963

VOLUME 29

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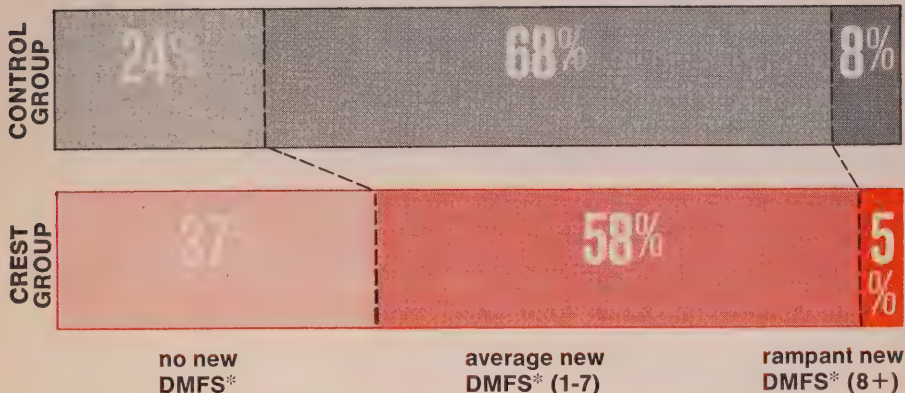
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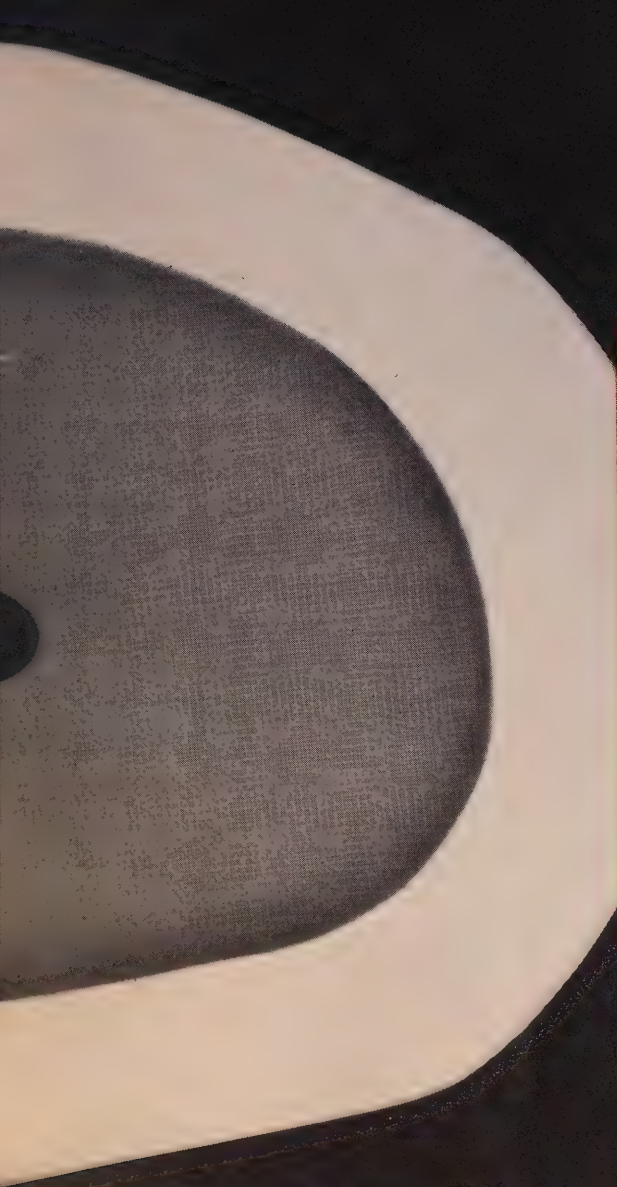
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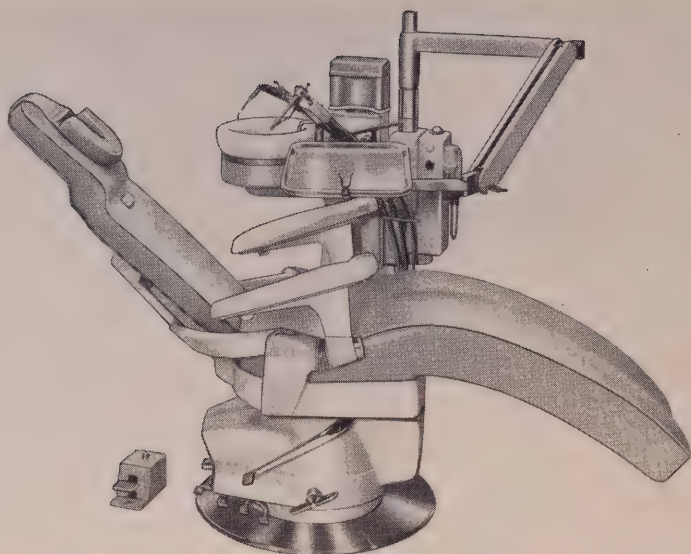
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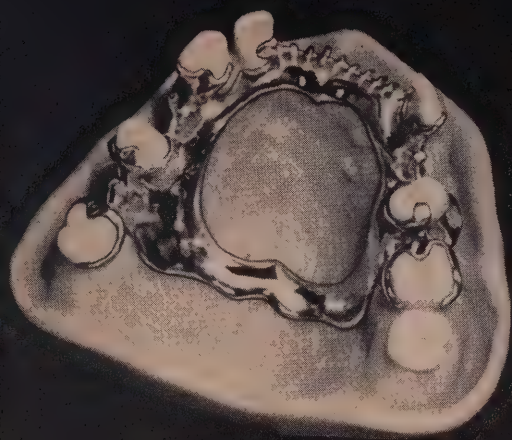


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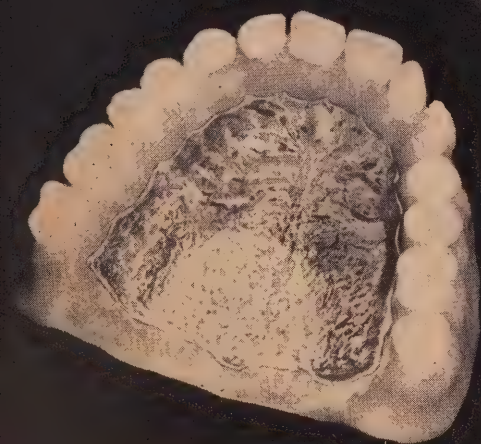
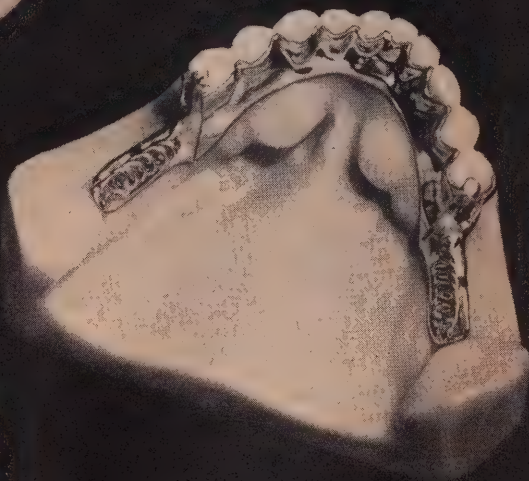
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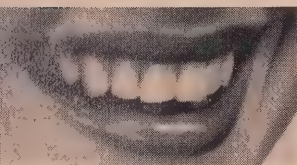
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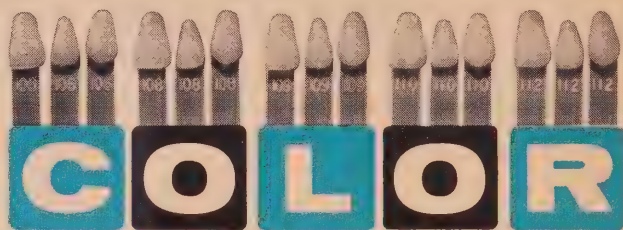
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Published monthly for the Canadian Dental Association by Gordon V. Allen Publications, 95 King Street East, Suite 205, Toronto, Ontario. Telephone 368 6251.

Gordon V. Allen, Advertising Manager.

Subscription price of Journal in Canada, Great Britain, the United States and all other countries, \$5.00 per year.

Authorized as Second Class Mail, Post Office Department, Ottawa, and for payment of postage in cash.

All additions and changes of address should be sent to the Managing Director before the 20th of the month, to become effective the following month.

All expressions of opinion and statement of supposed fact are published on the authority of the author who submits them and do not necessarily express the views of the Canadian Dental Association, unless such statements or opinions have been adopted by the Association.

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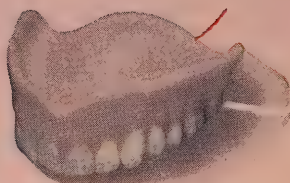
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The Canadian Dental Association

Volume 29

Number 6

Toronto

June 1963

JOURNAL

L'Association Dentaire Canadienne

**Simplified procedure for stainless
steel crowns in paedodontics**

H. W. Helm, B.Sc., D.D.S., Vancouver, British Columbia

One of the most useful restorative aids in the conservation of children's teeth is the chrome steel crown form. Many thousands of teeth, which for lack of adequate coronal tissue would have been justifiably and properly extracted, are now being safely and functionally restored with stainless steel crowns.

Many practitioners have been loath to employ these restorations because of prejudice, unfamiliarity with their use, or

because they feel that they represent something short of first-class operative procedure. As with any other material, improper and careless technique could result in a definitely substandard restoration. However, when careful caries removal and tooth preparation is followed by accurate crown fitting, this type of restoration will surpass all but the cast gold crown when used under difficult restorative conditions.

The time factor, a very important one in paedodontics, can be greatly reduced with practice and frequent use to the

Presented for the Intercity Pedodontic Study Club at the Annual Meeting of the Canadian Dental Association, Vancouver, June 5, 1962.

point where two proximally-placed crowns could be completed within a half-hour appointment. To aid in this, a record is kept of the crown sizes used on the first operative appointment so that there may be a guide as to ensuing crown sizes. Crowns may sometimes be partially prepared beforehand, or at least prior to the placing of the rubber dam so that actual chair time for the child may be shortened.

INDICATIONS

The use of a stainless steel crown is indicated in the following circumstances:

1. Teeth with badly broken-down crowns providing insufficient retention for amalgam.
2. Non-vital coronal portion of a tooth as in so-called "vital" or "devital" pulpotomy. These treatments render the upper buccal and lower lingual walls prone to fracture.
3. Hypoplastic teeth or those lacking enamel partially or completely.
4. Poor oral hygiene which has little possibility for improvement, as in mental retardation, low intelligence levels, etc.

TECHNIQUE

1. Ascertain the proper crown size by fitting an unadapted crown form over the unprepared tooth. It should go on without forcing so that subsequent "belling" of the gingival margins will provide the necessary snug adaptation and retention.
2. Prepare the tooth under rubber dam isolation by first removing all carious material. Removal of decalcified or carious tissue in the gingival area provides helpful retention for the finished crown. Gross bulges and cusp tips should be reduced for accurate adaptation. The mesio-buccal bulge of the deciduous mandibular first molar should receive special attention. Sometimes it may be necessary to reduce the mesial, distal or both surfaces.
3. Prepare the crown form by first shaping the gingival contour to that of

the tooth. Use a pair of common dividers to obtain the occluso-gingival dimensions at several points and transfer them to the crown form with scratch marks to guide in the trimming with either straight or curved crown-and-bridge scissors. Do not leave any flat spots in the contour, but follow the gingival line as faithfully as possible. Have the finished margin just below the gingival tissue.

4. Punch a hole (the smallest in an old rubber dam punch) in a lingual cusp for the escape of air and excess cement during cementation. Roughen the inside of the crown slightly with an air turbine driven bur, and smooth the gingival margins with a rubber abrasive wheel.

5. Final fitting is accomplished by repeated and continuous bending around the gingival margin to effect a smoothly-belled or rounded undercut result. No. 115 pliers are used for this purpose. This procedure also tends to work-harden the metal and will prevent it from being permanently distorted when passed over the remaining bulges of the tooth. A snap-on fit should be obtained for best retention.

6. Place material for pulp protection or required treatment.

7. Cement the crown in place with any good silico-phosphate cement,* having first used a thin mix to coat and partially etch the tooth surface for maximum adhesion. Follow by partially filling the crown with a medium thick mix and carefully seat the crown as far as possible with the rubber dam in place, using an orange wood stick to avoid distortion of the crown. Remove the rubber dam after having first removed the excess cement, and immediately seat the crown completely with a final check of the occlusion before the cement has set. Do not have the child bite the crown into place, as this may result in permanent distortion of the occlusal surface of the crown.

8. Remove the sub-gingival cement with a small wax carver and finish by polishing with a rubber prophylaxis cup and paste.

*The author uses *Petrolit* cement distributed by Premier Dental Mfg. Co., Philadelphia.

9. Dismiss the patient with a small cotton roll over the crown to avoid washing cement from the escape hole. This may later be filled with amalgam if desired.

In exceptional cases, these crowns may be adapted to permanent molars and bicuspid until development is such as to justify cast gold crowns. Much greater care is required in these cases to avoid possible temporomandibular joint disturbance due to a high or imbalanced crown.

RÉSUMÉ

L'emploi des couronnes en acier inoxydable peut se faire dans les cas suivants: (1) dent dont la couronne est avariée à un point tel qu'elle n'offre pas de rétention pour une obturation en amalgame; (2) couronne, où la pulpe a été enlevée au cours d'une pulpotomie et où une paroi est affaiblie; ces traitements rendent parfois fragile la paroi buccale des molaires supérieures et la paroi linguale des inférieures; (3) dent hypoplasiee ou celle qui manque partiellement ou complètement d'émail; (4) chez les enfants sans hygiène buccale et où, à cause de déficience mentale, il n'y a que très peu de chance d'amélioration.

L'auteur préconise cette technique:

1. Déterminer le volume exact de la dent en ajustant une couronne sur la dent telle qu'elle est; cette couronne devrait contourner la dent sans effort, pour qu'une fois que son contour gingival aura été plié vers la dent, elle se maintienne facilement en place.

2. Tailler la dent, la digue en place, en enlevant d'abord la carie. L'ablation du tissu décalcifié ou carié à la portion gingivale aidera à une bonne rétention de la couronne définitive. Éliminer les convexités considérables et les cuspes pour favoriser l'adaptation de la couronne. Porter attention à la convexité mésio-buccale de la première molaire primaire. Diminuer à l'occasion les faces mésiale ou distale, ou les deux à la fois.

3. Préparer la couronne en corformant d'abord la partie gingivale pour qu'elle s'adapte bien au collet de la dent. Se servir d'un compas pour connaître la hauteur occluso-gingivale à différents points et transposer cette dimension sur la couronne en y faisant des marques pour faciliter sa taille à l'aide de ciseaux droits ou recourbés. Ne pas laisser d'endroits plats dans le contour, mais suivre la ligne gingivale aussi fidèlement que possible.

4. Percer un trou (à l'aide de la plus petite dent du poinçon à digue) dans un cuspe lingual de la couronne pour la sortie de l'air ou de l'excès du ciment au cours de la mise en place définitive de la couronne. Dépouler l'intérieur de la couronne avec une fraise actionnée par une turbine et polir le bord gingival avec un disque en caoutchouc.

5. Procéder à l'ajustement définitif de la couronne en pliant à plusieurs reprises le bord gingival pour lui donner une forme de cloche qui s'adapte bien au contour gingival de la dent. Se servir, pour ce travail, d'une pince no 115. Cette opération contribue à tendre le métal et à empêcher qu'il se torde en longeant les convexités de la dent. La meilleure adaptation s'obtient quand la couronne se place sur la dent avec un clic.

6. Déposer dans les cavités le médicament nécessaire pour protéger la pulpe ou autre.

7. Cimenter la couronne avec un bon ciment silico-phosphate, en enduisant d'abord l'intérieur de la couronne et la dent avec une couche claire dans le but d'obtenir une adhésion parfaite. Ensuite ajouter d'autre ciment de consistance moyenne et mettre en place la couronne aussi profondément que possible en présence de la digue, en se servant d'un bois d'oranger pour éviter la déformation de la couronne. Enlever la digue après avoir éliminé le surplus de ciment et enfoncer au fond la couronne en vérifiant l'occlusion avant que le ciment ait durci. Ne pas demander à l'enfant d'enfoncer la couronne en le faisant mordre sur elle; cette façon de faire risque de modifier à jamais la surface occlusale de la couronne.

8. Enlever le ciment qui sort sous la gencive avec un instrument à sculpter la cire et terminer en polissant avec une cupule en caoutchouc et de la pâte à prophylaxie.

9. Donner congé au patient en lui recom-

mandant de mordre sur un petit rouleau de coton pour prévenir la dissolution par la salive du ciment qui obture le trou pratiqué dans la couronne. Obturer plus tard si nécessaire ce petit trou avec de l'amalgamé.

1701 West Broadway

Riverdale preschool dental project: final report

H. S. Grey,* D.D.S., D.D.P.H., T. E. Ashton† and A. R. J. Boyd,‡
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On February 5, 1955 the Local Board of Health on advice from the Medical Officer of Health for the City of Toronto gave approval for a dental health project to be carried on with aid from a federal health grant. A grant-in-aid from the senior government was obtained and together with the allocation of certain funds from the Department of Public Health, Toronto, a dental health project known as the Riverdale Preschool Dental Project commenced operation on September 1, 1955. Grants-in-aid have been sought and received each fiscal year during the period 1955 to 1960 when the project reached the conclusion of its fifth year.

Before the introduction of this project, annual dental inspection in Toronto schools had revealed depressingly static or upward trends in the incidence of dental caries, despite a regular treatment program which had been in effect since 1910.

Statistical studies from elsewhere in Ontario had provided information showing the value of educational and diagnostic dental programs for preschool age

children. Some of the results from these studies precipitated the request for grant-in-aid from the senior government. The City of Toronto wished to determine the value of such a procedure within a densely populated urban area that had a high degree of population mobility together with certain language barriers. The project was launched, therefore, in the Riverdale health district in 1955 through the co-operative efforts of Toronto's Department of Public Health, the Toronto Academy of Dentistry and a grant-in-aid from the senior government.

The staff of this project consisted of one dental hygienist, supported by a dental assistant and clerk. This project was designed to embrace the following services:

1. Annual dental examination of all preschool children attending child health centres in Riverdale health district.
2. Counselling and consultation to parents on behalf of their preschool children.
3. Referral for treatment to family dentists wherever possible or to Department of Public Health dental clinics.
4. The direct application to the teeth of a fluoride solution (a) for children with no apparent dental defects, and (b) for children with all defects corrected.

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†Supervisor, Division of Vital Statistics, Department of Public Health, Toronto.

‡Medical Officer of Health, Toronto.

Since this project was initiated in September 1955, 9,664 children have been seen. Of these 3,980 had no apparent dental defects, 3,692 have been referred for dental care and at August 31, 1960, 1,786 had had all their dental defects corrected. Population movement within the Riverdale health district made it impossible to follow up and assess every case seen.

Funds were obtained in 1960 again through grant-in-aid to enable the dental hygienist to carry out the "Swab Test" designed and advocated by R. M. Grainger, professor of Biometrics, Faculty of Dentistry, University of Toronto, as a guide in counselling parents with respect to their particular child's susceptibility to dental decay.¹ This represents an excellent teaching aid, simple but impressive, and is considered by our department as a valuable adjunct to the armamentarium of the dental hygienist, as she carries out her parent counselling within the Riverdale area.

The project's findings, at the end of three years have been described in published scientific papers which have been presented before the Ontario Dental Association and the Canadian Public Health Association.² A comparative paper at the end of five years was presented before the Dental Section of the American Public Health Association during its 89th annual convention held in the fall of 1961 at Detroit.³

EXTERNAL ASSESSMENT

Since 1955, at the inception of this project, evidence has been forthcoming which reveals that a diagnostic and educational program such as the Riverdale Preschool Dental Project produces a significant improvement in certain specific aspects of dental health.

The graphic representation Figure 1 allows a comparison between Riverdale Project 5-year-old children who had been exposed to four successive periods of dental teaching and examination by the same hygienist and 5-year-old Riverdale kinder-

garten school children examined by the school dental officers during their annual dental examinations of all school children.

The project children portray an overall improvement in the level of dental care (No Dental Defects, No Caries Defects) together with a decline in both the criteria of complete dental neglect and deciduous tooth mortality.

The difference shown here one would assume was due to the hygienist's educational program since all other factors within the district remained relatively constant.

Since 1955, at the outset of the project, a close evaluation of the findings obtained from the examination of 5-year-old kindergarten children in Riverdale district has been kept. Multiple examiners have been used in the course of a routine annual random sampling of all of Toronto's school population (sampling ratio 1:7, odd age groups only) to obtain reliable estimates for a variety of dental conditions in each health district of the city. This department has therefore been able, since 1955, to carry out a yearly comparison between the dental findings of 5-year-old kindergarten children in Riverdale health district and the findings from the same age group children in two other health districts (Moss Park and Yorkville). All the findings of the school dental officers and the project dental hygienist have been recorded on Hollerith key punch mark sense I.B.M. cards.

The same dental hygienist carried out the dental examinations for all the project children for the years 1956 to 1960. During the fall of 1960 another dental hygienist recorded the findings derived from the project dental examinations which led to the introduction of examiner bias into the statistical data for the year 1961. During this same period the description of certain of the criteria was altered somewhat. Because of these factors the data for the year 1961 have been excluded from this report.

The statistical data representing the various dental criteria have been consolidated for the years 1958, 1959 and 1960 to

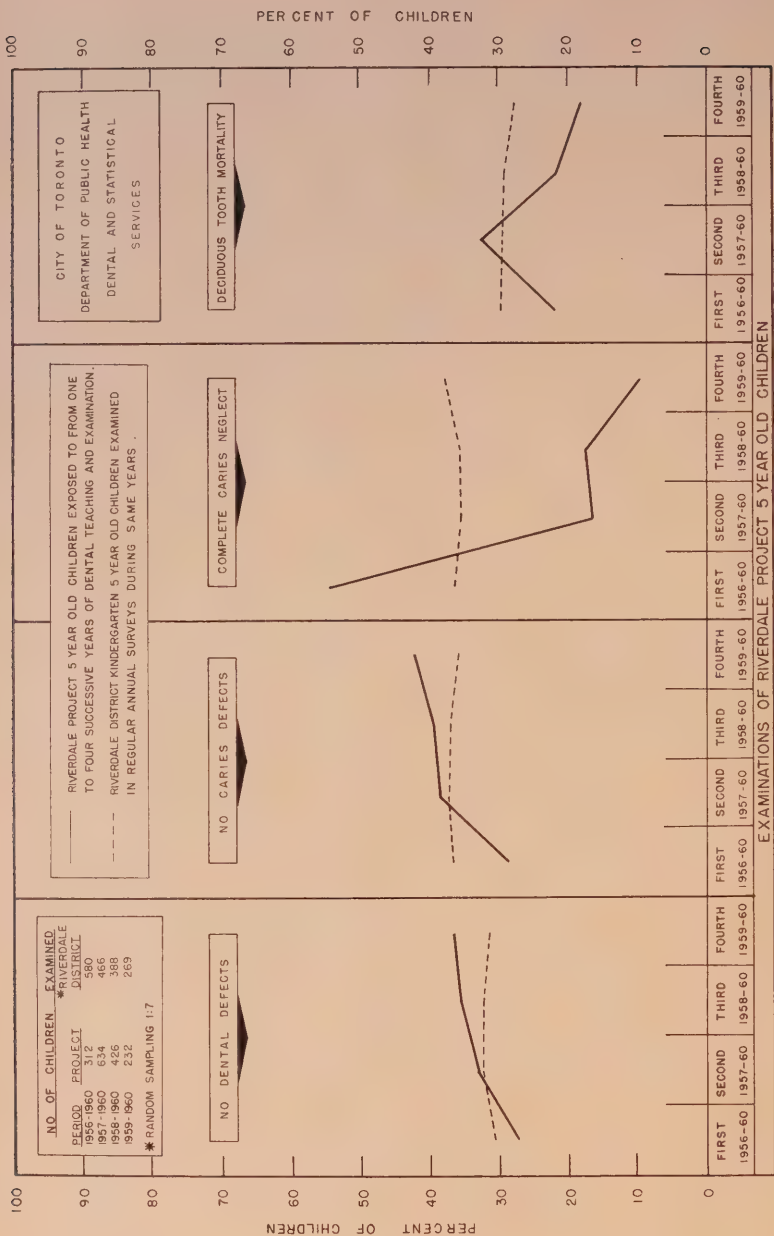


FIGURE 1 Riverdale preschool dental project, Toronto. Treatment level indices, 1956-60.

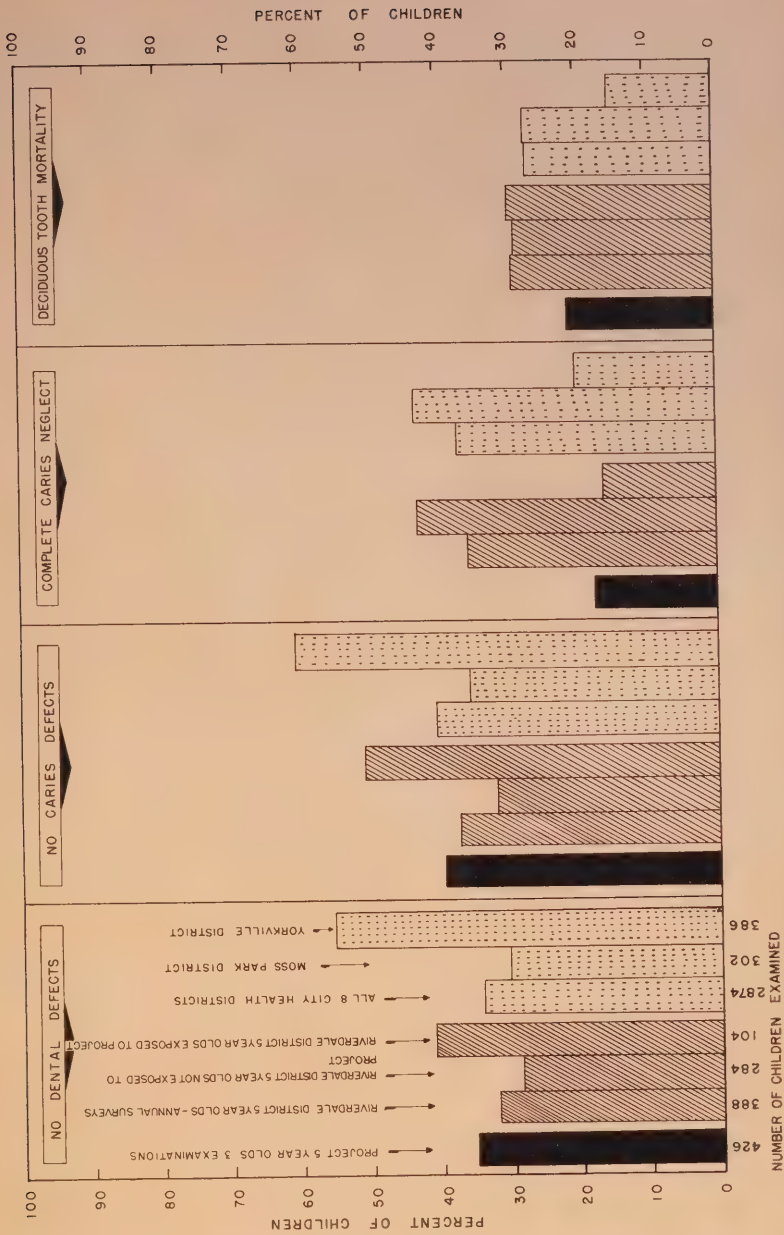


FIGURE 2 Riverdale preschool dental project, Toronto. Comparative statistics based on examinations carried out during years 1958-59-60.

allow an assessment representing the greatest number of 5-year-old children with a reasonable project experience (3 examinations) which had been carried out by the same hygienist.

The data covering the above-mentioned 3-year period will allow a comparison of Riverdale district 5-year-old children examined during the regular annual school dental survey and 5-year-old children from the two districts of Moss Park and Yorkville, and also with all districts combined for Toronto's 5-year-old school children.

The above-mentioned 3-year period allows the influence of the project children to be examined both when the data for these children is included with, and also excluded from, the data for Riverdale 5-year-old kindergarten school children. This has been possible since 1958. Since that time a record has been kept for all 5-year-old project participants who by age had passed into the Riverdale kindergarten school population.

Bar diagram, Figure 2, depicts these findings and on close examination it will be seen that for the criteria of No Dental Defects and No Caries Defects, which portray in part the level of dental care, the percentage of children who had received the hygienist's intensive educational program for three successive years, is higher than that for Moss Park. The percentage of Yorkville 5-year-old children for these two criteria is still higher than either Riverdale or Moss Park since a much better socio-economic level has been enjoyed by Yorkville since the outset of the project.

Again those children participating in the project for three successive years portrayed a lower percentage than Moss Park and Yorkville for the criteria known as Complete Caries Neglect, whereas for deciduous tooth mortality the percentage of project participants was lower than Moss Park but not as low as Yorkville. An improvement in the level of dental care is again exhibited by the project children for these criteria.

The effect of the project within the

Riverdale district itself becomes evident on examining the four criteria found in Bar diagram, Figure 2.

The percentage of 5-year-old project children in receipt of three successive years of the hygienist's program for the criteria of No Dental Defects and No Caries Defects is higher than the percentage for all the 5-year-old Riverdale kindergarten school children examined during the annual school survey.

The section depicting the lowest percentage for these two criteria is the section showing the 5-year-old kindergarten children, examined during the annual school survey, with all the project children excluded.

The criteria of Complete Caries Neglect and Deciduous Tooth Mortality portray the opposite effect with respect to the various percentages. Here the lowest percentages are recorded for project children again showing the beneficial effect of the children's contact with the dental hygienist.

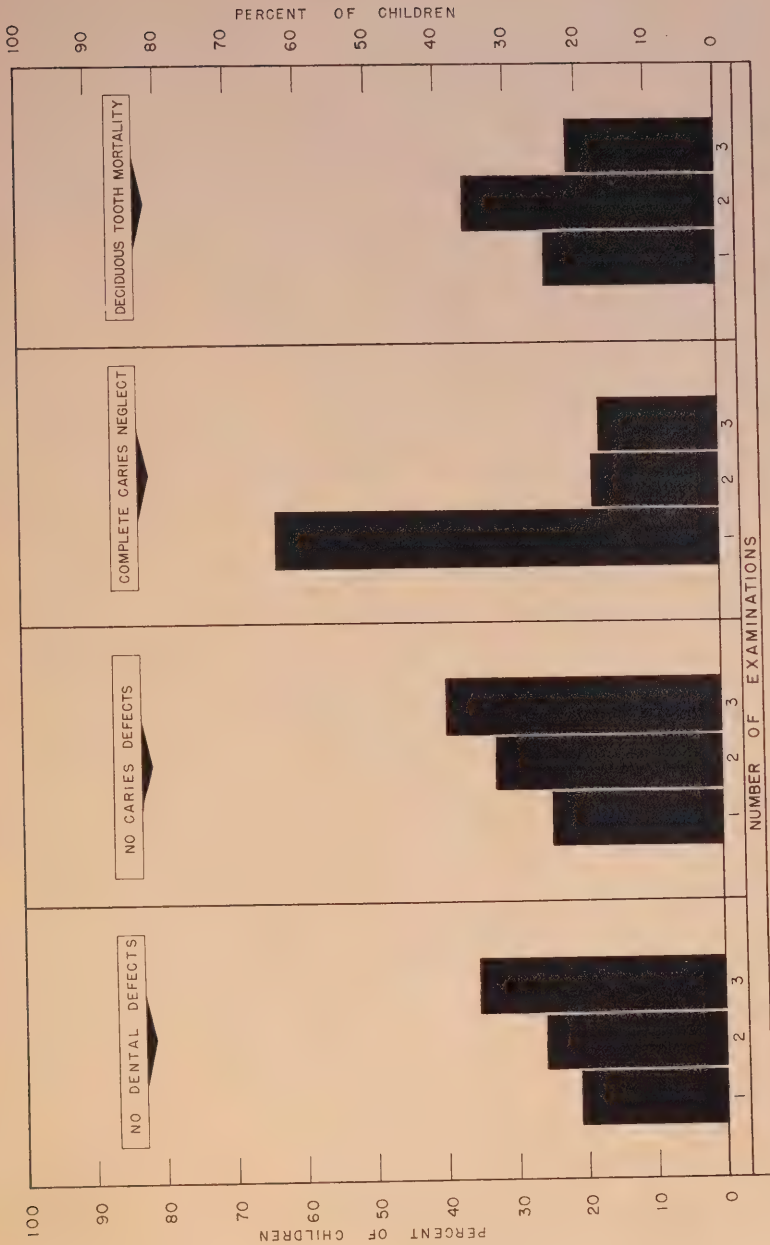
The conclusion follows that the higher level of dental care shown must be a reflection of the dental hygienist's project program since all other factors have remained relatively constant within the Riverdale district.

INTERNAL ASSESSMENT

The results experienced by the project children who had returned to the hygienist for their second and third examinations consolidated again for the years 1958, 1959 and 1960 are shown in bar diagram, Figure 3.

For the two criteria No Dental Defects and No Caries Defects a steady increase in the per cent of children in these two categories was realized between their first and second, and second and third visits to the hygienist.

A marked decline in the per cent showing Complete Caries Neglect is in evidence. The criterion known as Deciduous Tooth Mortality follows the expected



109 427 426

NUMBER OF CHILDREN EXAMINED

FIGURE 3 Riverdale preschool dental project, Toronto. Indices based on total examinations carried out during years 1958-59-60.

pattern. There is a rise between the first and second examinations, showing that the parents had taken their children to have the teeth extracted that were carious beyond repair, and then a marked decline again following the second examination since this phase of their treatment had been completed.

The four criteria together portray a definite increase in the level of dental care within the project itself which fact proves the value of the team's intensive "follow-up" telephone calls and written notices.

The hygienist reported that throughout the entire project the parents generally appeared to be anxious to return for their children's re-examination contacts with her. Population movement within the area made it extremely difficult and in many cases impossible to follow the original "starting" children throughout the period under review. Where an address was known mail or telephone appointments were sent out and revisits to the clinic were made faithfully. It was not necessary for the hygienist to make house calls.

TOPICAL STANNOUS FLUORIDE STUDY

In September 1957 a clinical study was initiated to evaluate the effects of a topically applied stannous fluoride solution to the deciduous dentition of three hundred project children between 2½ and 4½ years of age. The stannous fluoride solution was given to 150 children; the remaining 150 children who represented the control group received an application of distilled water.

The three hundred children representing the total study received clinical examinations including bitewing radiographs from the same dentist, who was unaware whether a particular child had been assigned to the fluoride group, or to the control group. The radiographs were interpreted without the knowledge of the treatment group for any given child. The deciduous cuspids and molars were used

throughout the study for the caries experience data. The hygienist carried out a prophylaxis first for each child, including thorough cleansing of the interproximal areas using sandpaper strips. This was followed by the application of a freshly prepared 8 per cent stannous fluoride solution or distilled water to the teeth of each child. This procedure was repeated one and two years later. 229 children were still available for observation at the end of two years: 116 children in the fluoride group and 113 children in the control group.

The children of the control group had an average d.e.f. surface increment of 2.87 and 6.98 after one and two years of the study respectively. The stannous fluoride group had a def surface increment of 2.40 and 4.92 at the end of the first and second years. Thus the def increment was 16.4 per cent lower after the first year and 29.5 per cent lower after the second year for the children in the stannous fluoride group than those in the control group. The general decrease in the def surface increment was 23 per cent. A decrease of 31.9 per cent was experienced for the interproximal surfaces. This evidence shows the greatest protection was afforded in the interproximal area by the stannous fluoride application.

CONCLUSION

Because of the marked improvement shown in certain selected dental health indices for the project children, together with the resultant upgrading apparent in both the dental treatment level and the prevalence of dental caries within the kindergarten age children in Riverdale health district, the Medical Officer of Health recommended to Board of Control and City Council through the Local Board of Health that similar projects be inaugurated within the remaining seven health districts of Toronto.

These recommendations were adopted on May 24, 1960. Commencing April 1, 1961 this type of service became an inte-

gral part of the overall dental program of the Department of Public Health for Toronto.

RÉSUMÉ

Un programme d'éducation dentaire pour les enfants d'âge pré-scolaire a été institué, comme expérience, dans le district sanitaire Riverdale de Toronto, en 1955. L'équipe chargée de mettre en action ce programme comprenait une hygiéniste, une assistante et une commis. Cette équipe prodiguait les services suivants: (1) examen dentaire, tous les ans, de tous les enfants d'âge pré-scolaire fréquentant les unités sanitaires du district de Riverdale; (2) conseils et entrevues donnés aux parents au sujet de leurs enfants; (3) direction des enfants ayant besoin de traitement à leur dentiste de famille ou aux cliniques dentaires du Service de santé publique; (4) application de fluorure topique, pour chaque enfant, sur les dents saines ou sur celles qui avaient été réparées.

Cette expérience, quand elle prit fin en 1960, révéla une amélioration notable des dentures de ces enfants; le niveau de la préoccupation de la santé dentaire, comme le montraient certains indices spécifiques, avait fait un progrès immense. Ces constatations furent surtout vérifiées chez les enfants qui avaient participé au programme durant toute sa durée. La migration des citoyens de ce district a rendu très difficile, parfois même impossible, la compilation des statistiques pour chacun des enfants du début à la fin de l'expérience. Les parents, cependant, semblaient

désireux de revenir pour faire re-examiner leurs enfants tout au long de ce programme.

En septembre 1957, on a entrepris des recherches cliniques pour évaluer l'effet de l'application de fluorure d'étain sur les dents primaires des trois cents enfants, de 2 ans et demi à 4 ans et demi, qui participaient au programme. On a appliqué une solution de fluorure d'étain à 150 enfants; l'autre groupe de 150 enfants, qui servait de groupe-témoin, ne reçut que de l'eau distillée. On se servit de radiographies coronaires en plus de l'examen clinique pour évaluer les résultats. Le groupe traité au fluorure d'étain montra une diminution de l'indice f.m.d. de 23% pour les faces occlusales des dents et de 31.9% pour les faces proximales. Ces chiffres indiquent que le fluorure d'étain eut plus d'effet sur les faces proximales des dents.

Ce service dentaire pour les enfants d'âge pré-scolaire eut tellement de succès que le service de santé publique a décidé de l'intégrer dans son programme général de santé dentaire à partir du 1er avril 1961. De plus, ce service aux enfants d'âge pré-scolaire est graduellement organisé dans les sept autres districts de la ville, à mesure que le personnel et les disponibilités le permettent.

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Dental Hygienists in Canada • In January 1963, 88 dental hygienists were practising in Canada. New Brunswick, Prince Edward Island and Newfoundland had no dental hygienists at that time. — C.D.A. Bureau of Economic Research.

Retrograde amalgam filling of the root canal

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One frequently encounters teeth with a periapical lesion, where a post restoration obstructs conventional entry into the root canal via the pulp chamber. In such instances, periapical curettage and root resection are performed first, followed by the placement of amalgam at the apex of the root in a specially prepared cavity. This procedure is usually referred to as retrograde amalgam root canal filling or amalgam resection.

Amalgam, as a filling material, can be thoroughly condensed against the cavity walls, and forms an excellent seal. In addition it is well tolerated by the surrounding periapical tissues.

There is, however, a tendency to shy away from the use of amalgam at the root apex since with most techniques in use today, the placement of amalgam is difficult to control and invariably more amalgam falls into the bony wound surrounding the root apex than is actually condensed into the apex of the root canal. These excess particles are difficult to remove and even after continuous irrigation, a postoperative radiograph usually reveals a generous sprinkling of amalgam in the bony wound surrounding the root apex.

It is the purpose of this article to review an efficient, workable technique in the handling of amalgam to seal the root apex in teeth undergoing indirect resection.

INDICATIONS

Retrograde amalgam filling is considered advisable under the following conditions:

1. In teeth carrying post restorations where a radiograph reveals the presence of a periapical lesion.

2. Where a patient is reluctant to have a well fitting porcelain jacket crown or gold restoration perforated in an attempt to enter the root canal via the pulp chamber.

3. Where there is an obstruction in the root canal which cannot be bypassed, e.g. pulp stones, broken files, etc.

4. Where a previous root canal filling is unsuccessful and a periapical lesion has resulted, amalgam can be used to seal the apex following periapical curettage, thus eliminating the necessity of refilling the root canal.

5. In routine procedures, where periapical curettage is performed, with or without root resection, the gutta-percha filling is sealed apically with a warm spatula following the resection. This often produces slight shrinkage in the gutta-percha filling and causes the margins to contract slightly thus breaking the apical seal. Therefore, if a little gutta-percha is removed from the apex, even in routine root resections, and amalgam is condensed into the root apex, a much better seal is obtained.

TECHNIQUE

1. After obtaining adequate local anesthesia and observing asepsis, a semi-lunar incision is made above the involved tooth, extending it to at least the width of a tooth on either side. An allowance of at least 2-3 mm. of tissue is made between the edge of the incision and the free gingival margin. A periosteal flap can now be elevated exposing the labial plate of bone.¹

2. The labial plate can be removed, if it is not already destroyed, using either a



FIGURE 1 Diagrammatic representation of the preparation for retrograde amalgam filling. The cavity for the amalgam filling is shown at (a).

bur or mallet and chisel, until the apex of the root is clearly exposed.

3. The root apex is resected with a No. 558 or 701 bur, preferably using a straight handpiece. Then the rest of the periapical lesion can be curetted away leaving the severed root apex protruding into a clean, bony wound.

4. During the curettement of the granulation tissue there may be a little pain present, especially if the periapical area is rather extensive, even though the local anaesthetic administered at the outset seemed adequate. Irrigating with a little local anaesthetic instead of normal saline at this stage can often be helpful.²

5. Once the debris, granulation tissue and chips of bone have been thoroughly curetted, the wound is packed with $\frac{1}{4}$ inch gauze to help control the bleeding and keep the area relatively dry.

6. A No. 701 bur in a straight handpiece is used to bevel the root toward the labial aspect. Next, an inverted cone bur is used

in a contra-angle handpiece to enlarge the root canal opening to approximately 2 mm. in diameter and $1-1\frac{1}{2}$ mm. in depth, with suitable undercuts so as to provide good retention for a reasonable thickness of amalgam (Figure 1). The soiled gauze can now be removed.

7. When the root apex has been prepared, the entire bony wound is packed tightly with $\frac{1}{4}$ inch gauze strips until the entire space is obliterated, exposing only a root apex with a small Class 1 cavity, completely embedded in gauze. In this way (1) the field is kept dry, and (2) there is no space where scraps of amalgam may lodge.

8. The operation of filling is accomplished by means of an amalgam plugger with a serrated end* making sure the diameter is slightly smaller than the diameter of the prepared cavity. The serrations will aid the amalgam to adhere to the plugger for a short while, since this plugger is used as both an amalgam carrier and a plugger to condense the amalgam.

9. Some amalgam is placed in a squeeze cloth or folded sheet of rubber dam, while holding it between the fingers, and the end of the serrated plugger is run through the amalgam. A small bit of amalgam is picked up at the end of the plugger. This will be roughly equivalent to the diameter of the plugger. This bit of amalgam is carried to the cavity, while adhering to the end of the plugger, and condensed into the root apex. Usually four to five such applications will completely fill the prepared cavity right to the surface. The surface is now burnished to ensure a good apical seal.

10. As the $\frac{1}{4}$ inch gauze strips are removed, any bit of amalgam scraped from the surface of the condensed filling will adhere to and be removed with the gauze, leaving the periapical tissues completely free of any amalgam scraps. The area can now be irrigated lightly with a little normal saline and the flaps sutured in place.

*The author uses an S.S. White No. 1 amalgam plugger.

A final postoperative film can be taken at this time.

SUMMARY

A few of the indications for performing a retrograde amalgam root canal filling have been enumerated and a method for handling the amalgam following periapical curettage has been reviewed. An excellent apical seal is obtained in this way and good healing of the periapical tissues invariably follows.

RÉSUMÉ

On conseille d'utiliser une obturation inversée en amalgame dans les cas suivants: (1) dents obturées avec un pivot et qui souffrent d'une lésion périapicale; (2) patients qui hésitent à faire percer une bonne couronne de céramique ou une bonne obturation en or pour atteindre la chambre pulpaire par la couronne; (3) dents, dont le canal est obstrué par un nodule, une lime brisée, etc; (4) dents dans lesquelles un traitement de canal n'a pas réussi et à l'apex desquelles une lésion périapicale s'est formée; une obturation en amalgame peut-être utilisée pour fermer l'apex à la suite d'un curetage périapical et éviter de refaire l'ancienne obturation du canal; (5) habituellement, au cours d'un curetage périapical, avec ou sans apéctomie, on scelle l'obturation en gutta-percha avec un instrument chauffé; il s'y produit parfois un retrait de l'obturation en gutta-percha et une légère ouverture à l'apex de la dent occasionnant la disparition du scellement apical; on peut rétablir ce scellement, même au cours d'une résection apicale, en enlevant quelque peu du gutta-percha du canal et en y foulant de l'amalgame.

L'auteur recommande la technique suivante:

1. on pratique, sous anesthésie locale et en observant toutes les règles de l'aseptie, une incision en demi-lune au-dessus de la dent intéressée en prolongeant cette incision jusqu'aux deux dents adjacentes et

en allouant au moins 2 ou 3mm. de tissu entre le bord libre de la gencive et la courbure de l'incision; on soulève le lambeau pour exposer l'os labial;

2. on enlève, à l'aide d'une fraise ou d'un ciseau et d'un maillet, l'os qui recouvre l'apex de la dent, à moins que cet os ne soit pas déjà éliminé par l'infection;

3. on coupe l'apex avec une fraise no 558 ou 701 en se servant de préférence de la pièce à main; le reste de la lésion périapicale peut alors être cureté, en laissant en évidence la racine dans la cavité osseuse bien nettoyée;

4. le patient, quand on curette le tissu de granulation, surtout si la lésion est considérable, peut ressentir une légère douleur, même si au début de l'intervention l'anesthésie semble excellente; on peut atténuer cette douleur en irriguant la cavité osseuse avec de la solution anesthésique plutôt qu'avec du sérum physiologique;

5. quand la cavité est parfaitement nettoyée des débris, du tissu de granulation et des fragments d'os, on peut la remplir de gaze d'un demi-pouce de largeur, pour produire l'hémostase et l'assécher;

6. on se sert alors d'une fraise no 701 montée sur la pièce à main pour biseauter la racine sur le versant labial; ensuite, avec une fraise à cône renversé montée sur le contre-angle, on agrandit l'ouverture du canal à environ 2mm. de diamètre et de 1½mm. en profondeur; on fait des points de rétention pour un volume convenable d'amalgame (figure 1); on enlève alors la gaze souillée;

7. une fois que l'apex est préparé pour recevoir l'amalgame, on entasse dans la cavité osseuse des lanières de gaze d'un demi-pouce de largeur en laissant paraître uniquement l'extrémité de la racine qui contient alors une petite cavité classe 1; de cette façon, le champ opératoire est sec et des parcelles d'amalgame ne peuvent séjourner dans la cavité osseuse;

8. on se sert, pour obturer la cavité, d'un fouloir strié (l'auteur se sert du fouloir no 1 S.S.W.), en s'assurant que son

diamètre est légèrement plus petit que celui de la cavité; les stries permettent à l'amalgame d'adhérer temporairement au fouloir, puisque celui-ci sert à la fois pour transporter et condenser l'obturation;

9. on place l'amalgame dans une rondelle de tissu qui sert à enlever le surplus de mercure ou dans un morceau de digue et on prélève directement l'amalgame avec le fouloir; de petits amas d'amalgame s'y fixent et on les porte à la cavité où on les condense; on a généralement besoin de quatre ou cinq portions d'amalgame prélevées au bout du fouloir; on brunit à fond l'obturation pour sceller la cavité;

10. on enlève alors la gaze qui entraîne avec elle tous les débris d'amalgame; on est assuré ainsi de la propreté de la cavité osseuse; on peut alors irriguer la cavité avec du sérum physiologique; on referme la plaie à l'aide de points de suture; on contrôle avec une radiographie.

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Parents' impressions concerning dental health of children

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Teaching dental health is part of the dentist's responsibility to his patient. In paedodontics, it is particularly important for the dentist to present dental health information to both the patient and the parent. For effective teaching, the selection of material and its method of presentation is considered important.

There are reports of various methods used to teach dental health to patients and parents in recent literature.¹⁻³ Starkey⁴ evaluated four different methods of presenting dental health information to parents of patients. He separated 125 parents into 5 different groups: group 1 read printed material; group 2 read the material and viewed slides illustrating the material; group 3 listened to a recording

of the material; group 4 listened to a recording and viewed the slides; and group 5 provided the controls, receiving no information. It was concluded, after testing the parents of the separate groups, that each of the four methods used was of definite value in presenting dental health information to parents, and that the simpler methods of presenting the information were just as effective as the more complicated ones.

Selecting material for use in patient education depends first of all on the educational requirements of the patient. A step-by-step procedure in educating the patient about modern dental methods was recently outlined by Hollander.⁵ In the first step of his outline he advises the dentist to get to know the patient's attitude toward dentistry. For the teaching of dental health, therefore, it would be help-

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QUESTIONNAIRE FOR PARENTS OF DENTAL PATIENTS

Name of parent _____ Name of child _____ Age _____

Father's occupation _____ No. of children _____ Ages _____

1. What do you believe is the greatest cause of tooth decay in children today?

2. What is the main cause you would give for the decayed teeth in your child's mouth?

3. (Ask only those who answered "sweets" to Question 2).
What kind of sweets are the greatest cause of tooth decay in your child?

4. Why do you think it important to save primary (baby) teeth?

5. By what age do you think a child will lose all his back primary (baby) teeth?

6. Has your child, as far as you know, any permanent teeth in the back yet?

7. Do you help brush your child's teeth?-----
8. When are your child's teeth brushed more thoroughly, morning or bedtime?

9. If you had to choose a hard or a soft tooth brush for your child, which one?

10. What kind of material would you say the dentist usually uses for filling back teeth?

FIGURE 1

ful to know some of the ideas on the subject that are already held by the patient.

The dental health concepts of the family were considered in a previous survey conducted by the American Dental Association's Bureau of Economic Research.⁶ Another study⁷ has reported on the public's experience and feelings about the way dentists practise dentistry. This survey attempts to discover some of the opinions, beliefs and knowledge of dental health already held by parents whose children are commencing dental treatment. Also included are some recommendations, based on the findings, as to the kind of dental health education needed.

SAMPLE AND METHODOLOGY

The sample consisted of a group of 200 parents selected from a much larger group who applied for dental treatment for their children at a dental clinic of the Metropolitan Health Department of the City of Vancouver. These parents were selected because they seemed co-operative and communicative, and because their children were reasonably well-dressed, clean and of apparent average intelligence. The group was limited further to parents of children who had not received any previous dental treatment. This limitation was imposed in order to reduce the possibility that any of them might have received more than an average amount of dental health information previously. There was an average of 3.1 children per family in this group. All the children, aged 4 to 7, were attending or about to commence kindergarten or grade 1. All the children had dental caries.

Parents were interviewed privately on the first visit, and a questionnaire consisting of ten questions relating to dental health was completed for each parent by the same interviewer (Figure 1). The purpose of the survey was explained to each parent and a number of questions were asked on specific aspects of dental health. The data presented in this study are contained in Tables 1 to 10 and are based

on the answers given verbally to these questions. The respondents were encouraged to answer all questions. The questions dealt with the ætiology of dental caries, the importance of deciduous teeth, the development of dentition, oral hygiene, and dental materials.

Three methodological biases of this sample should be observed: (1) Of the two hundred parents interviewed, 182 were mothers. It seems this absence of the father as an informant in compiling data is common in this type of study.⁸ (2) All the parents were from a working-class district. They were unable or did not desire to have their children's dental treatment performed by a dentist in private practice while dental treatment was made available to them at a nominal cost through the dental health services of the city. The occupation of the fathers by Shartle's⁹ classification:

Professional	6
Semi-professional	9
Business proprietors and managers	5
Clerical	49
Crafts, operatives and labourers	127
Students	4
Total	200

(3) As all the questions and answers were verbal, a certain amount of bias can be expected to have entered into the parents' responses to personal questions regarding their children. It will also be noted that some "leading" questions were asked.

DISCUSSION OF FINDINGS

Alleged causes of dental caries.—Since dental caries is considered the major problem in children's dental health, the first questions dealt with the causes of tooth decay. The majority of the respondents declared that either a dietary deficiency or excessive consumption of sweets was the main cause of dental decay, and many of the others said that soft teeth (acquired or inherited) were responsible.

TABLE 1 The primary cause of dental caries in children today, as reported by 200 parents.

Cause	Per cent reporting
Deficiency in diet	32
Too many sweets	27
Neglect of dental treatment	12
Soft teeth (inherited or acquired)	8
Lack of tooth brushing	7
Miscellaneous specific causes	5
Don't know	9
Total per cent	100

TABLE 2 The primary cause of dental caries in his own child, as reported by 200 parents.

Cause	Per cent reporting
Too many sweets	56
Lack of tooth brushing	17
Soft teeth (inherited or acquired)	11
Deficiency in diet	2
Miscellaneous specific causes	4
Don't know	10
Total per cent	100

TABLE 3 The kinds of sweets which are the primary cause of dental caries in his own child, as reported by 112 parents.

Kinds of sweet	Per cent naming the specific sweet indicated
Candy	87
Soft drinks	36
Cookies, cakes	19
Gum	15
Jams, syrups	4
Ice cream	2
Other	4
Total per cent (some named more than one kind of sweet)	167

The relationship between heredity and the incidence of dental caries has not yet been fully investigated or explained.¹⁰ Many people who blamed soft teeth mentioned that teeth will decay or will not hold fillings because they are "soft." Occasionally we see an obvious "soft" tooth in a child's mouth, and when we do, it appears as hypoplastic enamel resulting from incomplete or defective enamel development. Although the causes of these defects are not always known, some are related to birth difficulties and brain injuries.¹¹ Enamel hypoplasia may also be due to local infection or trauma to the

TABLE 4 Reasons parents gave for the importance of saving deciduous teeth.

Reason	Per cent giving the reason indicated
For the permanent teeth to come in healthy	42
For the permanent teeth to come in straight (or for keeping space for permanent teeth)	39
For general health	11
Primary teeth not important	3
For the chewing of food	3
Miscellaneous specific reasons	2
Don't know	5
Total per cent (some gave more than one reason)	105
Total number	200

developing tooth. There is no evidence to show that "soft" teeth are more susceptible to decay. In fact it has been shown in a recent study¹² that there is actually a proportional decrease in enamel hardness* as the amount of available fluoride (as evidenced by fluorosis) is increased. It therefore appears that although fluorosed teeth are more resistant to decay and less soluble in acid, they are incidentally softer. In contrast to this, Phillips and Swartz¹³ found that hardness was increased when topical fluorides were applied to the enamel surface.

Diet.—When questioned about his child's diet, it seems that the parent often takes a defensive attitude when asked about the dietary adequacy of his own child. This was evidenced here by a lack of consistency in the answers to the first two questions. When the parents were asked what they believed was the main cause of tooth decay in today's children, 32 per cent named a deficiency in the diet and 27 per cent blamed an excess of sweets. On the other hand, when asked to name the main cause of tooth decay in their own child, only 2 per cent of the

TABLE 5 Age by which a child will have lost all his posterior deciduous teeth, as stated by parents.

Age*	Per cent stating the age indicated
6 Years	1
7	4
8	10
9	6
10	22
11	11
12	31
13	7
14	1
Don't know	7
Total per cent	100
Total number	200

*When a period of more than one age was given (e.g. "between 10 and 12") the oldest age was recorded (i.e. in this example, age 12).

parents named a dietary deficiency, while 56 per cent blamed excessive sweets. Parental pride being what it is, many parents will probably admit to spoiling their children with too much candy rather than say that their children are not getting an adequate diet.

Dental caries does not seem to be associated with a general dietary deficiency.

*As measured with a Kentron microhardness tester to determine the Knoop hardness number of a tooth.

TABLE 6 Parents' responses when asked whether they were aware that their child had one or more permanent molars visibly present.*

Responses	Per cent of parents
Yes	54
No	33
Don't know	13
Total per cent	100
Total number	121

*All children of these parents had one or more six-year molars with at least 1/3 of the crown clinically erupted.

In fact it has been shown in two studies^{14,15} that undernourished children have significantly fewer carious lesions than well-nourished children. Although there are many unanswered questions about the aetiology of dental caries, we know that in most cases it is associated with excessive exposure to refined carbohydrate in the diet. Furthermore, several investigators, including Bibby,¹⁶ Gustafsson,¹⁷ and McDonald,¹⁸ have explained that the type of carbohydrate and the frequency of eating are two factors that have a definite influence on the caries attack rate.

Each of the 112 parents who named excessive sweets as the main cause of tooth decay in his own child was asked

to name some of the sweets he thought responsible. Most of them (87 per cent) mentioned candy and 32 per cent blamed soft drinks. It is surprising that chewing gum was included by 15 per cent while very few mentioned jams, syrups, or ice cream. Neither honey nor raisins, each with a high caries-inducing potential, was mentioned. It is known that some parents think they are avoiding cariogenic carbohydrates for their children by giving them honey or raisins.

The dentist is so often in a position to give dietary advice to the parent. He can explain that excessive or continuous eating of sticky sweets which adhere to the teeth provide a greater opportunity for the production of decay-causing acids. He can also suggest that children be trained early in proper eating habits, eliminating between-meal snacks; or substituting for these snacks "nutritious and detergent foods," such as celery, carrots, apples, oranges, peanuts.

Value of deciduous teeth.—It has been claimed that the average parent believes that the deciduous teeth are of little importance.³ As the parents taking part in this survey had already requested dental treatment for their children, they were asked the leading question "Why do you think it important to save primary teeth?" Their answers indicated that most of them were especially concerned about the effects that diseased or prematurely lost

TABLE 7 Responses given by 200 parents of children aged 4 to 7, when asked whether they helped brush their child's teeth.

Parent's response	Parents divided according to age of child				Total
	Age 4	Age 5	Age 6	Age 7	
Yes	18 (75%)	20 (40%)	31 (29%)	4 (21%)	73
No	4 (17%)	31 (60%)	74 (70%)	14 (74%)	123
Does not brush	2 (8%)	0 (0%)	1 (1%)	1 (5%)	4
Total number	24	51	106	19	200
Total per cent	(100)	(100)	(100)	(100)	

TABLE 8 Parents' responses when asked whether their children brushed their teeth more thoroughly in the morning or at bedtime.

Time	Per cent giving the time indicated
Morning	34
Bedtime (night)	48
Same (equal)	10
Don't know	6
Never	2
Total per cent	100
Total number	(200)

deciduous teeth would have on the permanent teeth. However, only 3 per cent of these parents considered the deciduous teeth important for the mastication of food. From this it can be concluded that most parents do not realize the importance of deciduous teeth in the process of digestion. Therefore it falls to the dentist to explain that neglect of these teeth can result in improper diet. Instead of the child eating meats and vegetables and fresh fruits, he will, because a tooth is perhaps sensitive, turn to the softer foods, usually the foods high in carbohydrate.

Exfoliation.—Although 31 per cent of the parents knew the age by which their children will lose all their deciduous teeth, most of the remaining 69 per cent thought that their children would lose them much sooner than the normal exfoliation age of 12 years (Table 5). Many parents whose six-year-old children are beginning to lose their deciduous incisors, are astonished to learn that the life span of the deciduous molars is another 5 or 6 years.

Eruption.—Parents of six-year-olds are often unaware that their children have permanent molars present in their mouths. One hundred and twenty-one of the 200 children in this survey had one or more permanent molars that could be easily seen. (This was later confirmed clinically: When at least one-third of the crown of a

TABLE 9 Parents' responses when asked to choose either a hard or soft bristled toothbrush for their child.

Kind of bristle	Per cent choice of bristle indicated
Hard	47
Soft	36
Don't know	17
Total per cent	100
Total number	(200)

TABLE 10 Respondents' answers when asked to name the kind of material that is usually used for filling posterior teeth.

Material	Per cent, giving material indicated
Don't know	46
Silver	18
Lead	8
Cement	5
Plastic	4
Metal	5
Amalgam or silver amalgam	3
Other*	11
Total per cent	100
Total number	(200)

*Among other names given: "zinc," "mercury," "solder," "aluminum."

six-year molar appeared in the oral cavity it was counted.) Just a little more than half (54 per cent) of the parents of these children were aware that their children's permanent molars were visibly present.

While there is much fanfare about loss of the child's deciduous teeth and the eruption of his permanent incisors, the eruption of his six-year molar is quiet and unobtrusive. Accounting for the great increase in caries at age six is the fact that most first permanent molars start to decay very soon after eruption.¹⁹ So, at the age when a child is most susceptible to caries, the first permanent molar so often becomes the victim of neglect. Loss of a first permanent molar can set off

a chain-reaction leading to malocclusion, increased caries, worsening of existing malocclusion, and periodontal disease. In a study of 433 nineteen-year old boys and girls by Marshall-Day,²⁰ it was revealed that 40 per cent of their first permanent molars were lost or required extraction, compared with 20 per cent of all their other teeth missing or requiring extraction. It is suggested, therefore, that parents of young children be warned that besides being "first in" the six-year molars are most often "first out".

Oral Hygiene.—It is generally agreed that oral hygiene has an important place in patient education. Parents are especially interested in instructions and advice on the use of the toothbrush for their children. However, from the answers given by the respondents taking part in this survey, it seems that most parents cease to help brush their children's teeth soon after they commence school. Seventy-five per cent of the four-year olds were assisted by their parents when they brushed their teeth, but only 40 per cent of the five-year olds received help, while 70 per cent of the age 6 children and 74 per cent of the age 7 children obtained no parental help with their toothbrushing.

There is conclusive proof that brushing the teeth within ten minutes after eating can reduce tooth decay to a greater degree than with the usual night and morning routine.²¹ Moreover, the use of the toothbrush can be recommended for aesthetic reasons, and for the benefit to gingival tissues. It is somewhat incongruous for the dentist to see a well-scrubbed and apparently well-cared-for child with teeth heavily laden with plaque and food debris. Parents who would not depend on their young children to brush their shoes properly so often give them no help in the brushing of their teeth. In a study²² of the toothbrushing habits of children it was shown that children under age 7 were usually much briefer and more haphazard and erratic than children above the age of seven. Thus, just when a child needs most help with his toothbrushing, at age

5 and 6, he is so often neglected in this important part of his personal hygiene. A ray of hope was found in another study,²³ which reported that 61 per cent of a group of children with "good" oral hygiene said they were taught how to clean their teeth by their dentist. In contrast, only 33 per cent of the children whose oral hygiene was rated as "poor" provided the same answer. It seems, therefore, that the dentist can teach significantly better oral hygiene practices in children.

Of the parents who participated in this survey, 34 per cent thought that their children brushed their teeth better in the morning than in the evening. It was also found that 47 per cent would choose a hard toothbrush rather than a soft one for their children. Although many dentists recommend a toothbrush of medium stiffness, it is believed that a brush with soft bristles is best for the very young child. Parents should be advised to begin brushing their children's teeth with a soft brush at the first appearance of the teeth.¹⁸ Starkey²⁴ recently described a technique for brushing the teeth of the young child which may be taught to parents. When the importance of caring for his teeth is instilled in the child's mind, he will continue to look after them himself when he is old enough.

Filling Material.—When patients have a tooth restored with a gold inlay, they usually give it special value because they can identify it as a restoration made with a precious metal. However, when a tooth is restored with silver amalgam, they so often give little value to this type of restoration. It was found here that most of the respondents either did not know or had vague ideas of what kind of material was usually used as a filling material for the posterior teeth. It would seem from this, that the dentist should be more specific when he describes this material, and that perhaps he should refer to it as "silver amalgam" instead of the ambiguous term "amalgam".

SUMMARY

The parents of 200 children commencing dental treatment at a Metropolitan Health Committee dental clinic in Vancouver took part in this survey. They were asked certain questions designed to discover some of their ideas on dental health. Although most of the respondents believed tooth decay could be blamed on the diet, many thought that soft teeth were responsible. Almost all the parents were concerned about the effects that diseased or prematurely lost deciduous teeth would have on the permanent dentition, but only 3 per cent mentioned that the deciduous teeth were important for the mastication of food. A significant number of parents thought the deciduous molars would be lost before the ages of normal exfoliation of these teeth. Only 54 per cent were aware of the fact when their children had one or more six-year molars visibly present in their mouths. From their answers it can be concluded that most parents give their children some help with their toothbrushing, but only until they commence school. Forty-seven per cent would choose a hard toothbrush rather than a soft one for their children. When asked to name the kind of material usually used to fill posterior teeth 46 per cent did not know, while only 18 per cent named it silver and a mere 3 per cent identified it as amalgam or silver amalgam.

CONCLUSIONS

Specific areas of dental health information requiring emphasis are listed as follows:

1. The cariogenic diet.
2. The importance of the deciduous teeth in the process of digestion.
3. The life span of the deciduous molars.
4. The child's need for dental treatment and help with toothbrushing, particularly at the age when he commences school.

5. A more descriptive term than "amalgam" for this restorative material.

RÉSUMÉ

Le dentiste a la responsabilité d'éduquer ses patients en matière d'hygiène dentaire. Ce rôle a beaucoup d'importance en péodontie, car, là, le dentiste doit instruire les enfants et leurs parents. La façon de faire l'éducation, pour qu'elle ait des effets, et le choix du matériel dont le dentiste se servira dans ce but ne sont pas choses négligeables.

Le choix du matériel dépend d'abord du degré d'éducation du patient. Cette enquête révèle des opinions, des croyances et des connaissances qu'ont déjà des parents, dont les enfants commencent à recevoir des traitements. Les parents de deux cents enfants qui en étaient à leur première visite à la clinique dentaire du comité métropolitain de Santé, à Vancouver, ont participé à cette enquête.

On leur posait certaines questions susceptibles de révéler leurs concepts sur l'hygiène dentaire. Plusieurs parents, quoique la plupart tenaient l'alimentation responsable de la carie dentaire, croyaient que la carie survenait à cause de la porosité des dents. Presque tous étaient au courant des influences néfastes des dents primaires cariées ou de leur extraction sur la denture permanente. Mais seulement trois pour cent d'entre eux ont souligné l'importance des dents primaires pour la mastication des aliments. Un nombre considérable de pères et mères croyaient que les molaires temporaires seraient extraites avant la période normale de leur exfoliation. Seulement cinquante-quatre pour cent savaient que les dents de six ans étaient présentes dans la bouche de leurs enfants. On peut conclure des réponses des parents que la plupart d'entre eux encouragent leurs enfants à se brosser les dents, mais seulement une fois que ceux-ci ont commencé la classe. Quarante-sept pour cent choisissaient pour leurs enfants une brosse à dents dure

plutôt qu'une molle. Quarante-six pour cent ne savaient pas quel matériel était utilisé pour obturer les dents postérieures de leurs enfants; seulement dix-huit pour cent savaient que c'était de l'argent et seulement trois pour cent ont précisé qu'il s'agissait d'amalgame ou d'amalgame d'argent.

Les domaines d'éducation en hygiène dentaire qui ont besoin d'être exposés sont les suivants: (1) alimentation qui favorise la carie; (2) importance des dents primaires dans la digestion des aliments; (3) durée normale des molaires temporaires; (4) besoins de l'enfant pour des traitements dentaires et pour être aidé à brosser ses dents, surtout à l'âge où il commence la classe; (5) une expression plus imagée que "amalgame" pour désigner le matériel obturateur.

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Dental Specialists in Canada • In January 1963, there were 219 specialists in the three specialties recognized by the Canadian Dental Association: 61 oral surgeons, 31 orthodontists and 27 periodontists. These specialties are certifiable in all provinces except Newfoundland. Some provinces certify other specialties as well. — C.D.A. Bureau of Economic Research.

Comminuted fracture of the mandible due to a gunshot

W. B. Donohue, D.D.S., M.Sc., Montreal, P.Que.

Most fractures of the mandible seen in an oral surgery practice tend to be of the simple and compound types, probably because of the type of accident which causes the fracture. Lower jaw fractures are frequently caused by a sudden intense force, directed at a limited area of the jaw, which results in a fracture at the point of impact, or at structurally weak points along the line of force, as for example the neck of the condyle. This type of fracture is seen frequently in automobile and sports accidents, and is usually not associated with a penetrating wound.

Comminuted fractures are less frequent than the simple or compound types. They tend to be associated with a force of greater intensity and are sometimes seen in conjunction with a penetrating wound. They may be due to explosions, gunshot wounds, and certain types of industrial accidents. Because of the shattering of bone associated with this type of fracture, they present a problem in treatment. The following case is presented because it illustrates some of the problems involved.

CASE REPORT

History and Examination. — The patient, a 36 year old caucasian male, was first seen at the hospital outdoor department with a history of having been shot two days previously during a hunting accident. He was now complaining of pain localized in the lower half of the face. Physical examination of the region showed a small penetrating wound in the region of the lower right submaxillary triangle, and a swelling of the face opposite the body of the mandible on the left side which caused an asymmetry of the face. A slight amount of trismus was present but the oral mucosa was not lacerated. The dental formula was:

65-321|1234567
321|1234

His health was excellent, and a general physical examination showed no pertinent abnormalities. He had received an injection of 1,500 I.U. antitetanic serum on arrival at the hospital.

Antero-posterior views of the skull, and lateral jaw radiographs, showed a comminuted fracture of the body of the mandible on the left side, with several radiopaque particles, evidently fragments of the bullet, in the region of the fracture (Figure 1 and 2). At first it was thought that a satisfactory alignment might be achieved by intermaxillary fixation alone, but it became evident that this would result in a permanent asymmetry since the bone fragments in the edentulous region could not be adequately controlled. This necessitated an open reduction of the fracture.

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FIGURE 1 Preoperative lateral view of the jaw showing the fracture site. Notice the numerous fracture lines, the radiopaque bullet particles, and the irregularity of the inferior border of the mandible due to displacement of the bone fragments.



FIGURE 2 Preoperative antero-posterior view of the skull. The fragments of bone show lateral displacement due to the force of the missile.

Surgical Procedure. — Six days following the accident an open reduction of the fracture was carried out under endotracheal general anaesthesia. Following the usual procedure, an incision was made parallel to the lower border of the mandible and along Langer's lines of tension. The platysma was divided, the facial artery and vein were located clamped and cut, and the fracture site exposed (Figure 3). A few loose bone fragments and bullet particles were removed from the fracture region, but care was taken not to remove any bone fragments still attached to the periosteum. No attempt was made to locate and remove all the bullet fragments. The main fragments of the mandible were brought into contact with one another, and held with 28 gauge stainless steel intraosseous ligatures. Intermaxillary fixation using modified Winter arches and elastics had been applied before starting the surgical procedure. The patient's occlusion was now checked and the tissues were closed in layers with catgut and dermalon sutures. Before leaving the operating room a Barton type pressure bandage was applied

around the head and over the fracture site in order to eliminate any "dead space" in the tissues, and minimize the postoperative oedema.

The intermaxillary fixation was maintained for six weeks, and except for an area of paresthesia along the lower lip the postoperative course was uneventful (Figures 4-7).

DISCUSSION

In one series of 564 mandibular fractures caused by high velocity missiles during World War II, slightly over 50 per cent were complete comminuted fractures of the body of the mandible.¹ Usually the impact of the missile on the bone and teeth in this type of injury causes a showering of bone fragments in the adjacent tissues, the bone particles acting

FIGURE 3 The facial artery is clamped by the two haemostats, and is about to be cut.

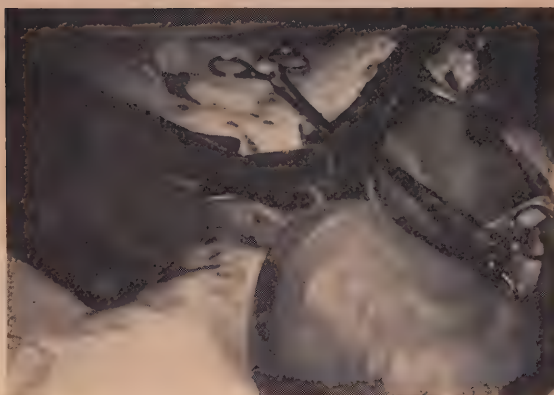


FIGURE 4 Postoperative view. Fine intraosseous ligatures may be seen running between the bone fragments. Compare the contour of the mandible with that seen in Figure 2.



FIGURE 5 Postoperative view. A few radiopaque bullet particles may be seen located in the floor of the mouth. Notice the realignment of the bone fragments.

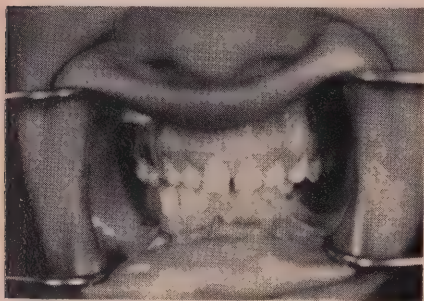


FIGURE 6 A view of the occlusion two months postoperatively.

as secondary missiles.² The fact that there was relatively little scattering of bone in the soft tissues in this case indicates that the velocity of the bullet had been mostly expended by the time it reached the mandible.

It has been frequently stated that in comminuted fractures of this type all bone fragments still attached to periosteum should be left in place. This would seem to be borne out again by the results

achieved in this case. The periosteal membrane serves as a source of osteoblasts during callus formation and the blood vessels of the periosteum maintain the vitality of the bone fragments during the healing period. Hence the importance of preserving the periosteum.

The metal fragments buried in the soft tissues surrounding the fracture were not removed because of the practical difficulty involved in locating them and because of the possible injury to the facial nerve during the exploratory procedure. The fragments remaining in the tissues did not seem to cause the patient any trouble during the two years he was followed postoperatively.

The use of pressure bandages following the surgical reduction of mandibular fractures is an important step in the treatment. They help to prevent the accumulation of fluid in the tissue spaces, which serves as an ideal medium for bacterial growth in infected cases. In this instance the pressure bandages were changed every two days and maintained for one week.



FIGURE 7 A view of the healing incision two months postoperatively. Two pigmented naevi may be noted, one at the anterior end of the incision, the other located on the neck.

SUMMARY

The treatment of a comminuted fracture of the mandible due to a gunshot is presented, and some aspects of the case discussed.

RÉSUMÉ

Cette histoire de cas traite d'une fracture comminutive du maxillaire inférieur, causée par un coup de fusil. Les figures 1 et 2 montrent l'état préopératoire, tandis que les autres montrent le résultat après la réduction ouverte de la fracture. Les expériences de la deuxième Guerre Mondiale indiquent que les fractures du maxillaire inférieur, causées par des coups de fusil ou par une explosion, sont

souvent des fractures comminutives. Ces traumatismes produisent un rayonnement des fragments osseux et métalliques dans les tissus avoisinants. Cet article appuie sur l'importance de conserver tous les fragments osseux attachés au périoste, les inconvénients possibles d'enlever tous les fragments métalliques à cause des difficultés de technique qui se présentent, et l'importance des soins post-opératoires.

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C.D.A. Attitude on Dental Insurance • While opposing a comprehensive treatment program "at this time," the Association lists the following conditions which should apply in the event of inauguration of such a plan: (1) intensive dental health education of the public should precede and accompany a treatment program; (2) the age groups to be included should be determined by initial and annual assessments of the people's needs and of the dental personnel and funds available; (3) treatment should be provided by dentists in private practice, on a fee-for-service basis according to an acceptable fee schedule; (4) dentists should be free to participate or not; (5) the rights of patients and dentists to select each other should be protected; and (6) administration should be effected by profession-sponsored dental service corporations. — C.D.A. Brief to the Royal Commission on Health Services.

C.D.A. Library Trust Fund • The circulation of books and periodicals by the Canadian Dental Association's Library provides a valuable service to Association members. Increased circulation and the purchase of new texts make greater demands on the Association's library trust fund. All donations to the fund are therefore gratefully received. Donors are furnished receipts which entitle them to income tax deduction.

Needed: more university admission scholarships

Will Canadian dentists give tangible support to the recruitment of future dental students? It is quite likely that they will, because a majority of them believe there is a national shortage of dentists and are willing to encourage young people to consider dentistry as a career.

The provision of financial aid to future students represents real evidence of this concern for the future of the profession. And there is mounting evidence of need in this regard. For example, nearly 40 per cent of the dental students at the University of Toronto received financial aid last year totalling more than \$100,000. Sixty-five per cent of this assistance was provided in the form of loans and 35 per cent as bursaries. This amount does not include scholarships and prizes awarded during the undergraduate course. Nor does it include those receiving assistance from the reserve officer training plan of the Royal Canadian Dental Corps.¹

This year the Royal College of Dental Surgeons of Ontario and the Dental Alumni Association of the University of Toronto instituted two admission scholarships in the preprofessional year at Toronto's dental school. The first of these is of the value of \$600. It is awarded to the student in the preprofessional year who has obtained the highest standing in Ontario Grade 13 examinations, with an average of at least 75 per cent. The other scholarship provides a minimum of \$250, and, in case of need, the winner may receive a maximum of \$500. Here again, the successful candidate must obtain at least 75 per cent in Grade 13 examinations. He must also demonstrate financial need.

Except for some government bursaries with return of service stipulations and the reserve officer training plan, these are the only outright admission scholarships at our dental schools. More awards of this nature are needed.

Dentistry is more costly than any other area of higher education, with the exception of the medical curriculum. While money is not the only factor, there is no doubt that this high cost can be an economic barrier for interested potential students, particularly those domiciled in areas distant from our larger university centres. A solution in the form of a gradual reduction and eventual abolition of university fees has therefore been recommended by the Canadian Dental Association. But for the moment this remains a distant goal. In the meantime valuable student material may be lost unless positive action is taken. The provision of more admission scholarships would be a real contribution in this regard.

Most universities circulate lists of available admission scholarships to be exhibited on secondary school notice boards. The inclusion of more dental admission scholarships could prove a powerful incentive to student recruitment.

The Journal welcomes the initiative already taken by two dental groups in creating such awards. We suggest that others might consider the worthiness of taking similar action now.

REFERENCE

1. Proceedings of the Royal College of Dental Surgeons of Ontario, 1961-62, p. 16.

The dentist as recruiting officer

Much has been said and written in recent years about what some describe as the most pressing problem facing our profession — the problem of dental manpower. It may be fair to assume that if the existence of the problem were universally accepted, less would be said and written about it and more would be done to meet it effectively and efficiently.

It seems then pertinent to begin by asking: "Is there a problem?" and, if so, "How serious is it?" and "What can we do to solve it?"

1. Is there a problem?—There appears to be ample evidence to support its existence. Dental manpower statistics relative to population certainly are not encouraging. There is one dentist in Canada to care, statistically, for 3,108 people.¹ Obviously, modifications must be made in this figure to suit special local circumstances; but, equally, in spite of these modifications, it is not realistic to find any comfort in the ratio reported.

The results of the questionnaire survey undertaken by the Canadian Dental Association in 1961 indicated that almost all respondents accepted the fact that Canada faced a dental manpower shortage on the national basis.²

In a practical way, there is evidence in support of the existence of a problem in the very great difficulty encountered by newcomers to some districts in being accepted at all as a patient into an established practice. As well, there is significant evidence in the fact that, even when accepted, a patient may be required to wait long periods for an actual appointment.

2. How serious is it?—However suspect statistics generally may be, one figure judged against another measuring the same factor, differing only in the locale

involved, must be considered to have significance. It was stated that one Canadian dentist is expected, statistically, to care for the dental needs of more than 3,100 Canadians. In the United States great concern is felt for the fact that one American dentist is expected to care for the dental needs of approximately 1,800 Americans.³

If a problem exists in the United States, it must be accepted that a far greater one of most serious proportions exists in Canada and all indications point to an ever worsening situation unless steps are taken now to meet it.

3. What can we do to solve it?—The solution to major complex problems is rarely found in monovalent action. In this case several courses may be followed as well.

First, the profession must blunt the sting of such unfavourable dentist to population ratios by attempting to reduce the demands for service placed thereby on our profession. Continued and strong support for the implementation of proven dental public health measures must be maintained. The universal application of water fluoridation measures would go a very long way in rendering our oft-quoted statistic less significant.

Secondly, the individual dentist can be encouraged to become more productive for a greater number of people. It has been shown that with proper distribution and proper use of dental assistants and hygienists a dentist may perform his services at undiminished quality, with greater productivity and for a larger number of people.

Thirdly, the individual dentist may be rendered more productive if he is permitted to delegate, under his supervision and control, certain treatment services heretofore his by law. Experiment is going forward presently in the training of this

class of auxiliary personnel. Relieved of these responsibilities the dentist may devote himself especially to those areas requiring his special skill and knowledge.

The essential eventual solution, of course, lies in the Canadian dental schools graduating larger numbers of qualified dentists to the profession. A respected educator has estimated that two or three new schools graduating forty to fifty new members to the profession by 1968 will significantly influence dentist to population ratios by 1980 in spite of sharply rising population projections.⁴

This most important aspect of our solution, however, depends for its success on the availability of sufficient number of qualified applicants to our schools. It is gratifying to note the improving trend evidenced in increased numbers of applicants being received by the dental schools. Due credit must be paid to the efforts of the national, provincial and dental school recruitment committees in bringing about these encouraging signs.

Each practising dentist in Canada will wish to play a part in the national recruitment program. Certainly, no one stands in a better position than we do to advise the young men and women and their parents in our practice about the possibilities and attractions of dentistry as a career. The Commission on the Survey of Dentistry in the United States points to the dentist as the person exerting the greatest influence on those who have made the decision to follow the study of dentistry.⁵

It is becoming commonplace, though no less factual, to state that if each Canadian dentist brought only one good applicant to the dental schools every five years, the future of the profession would be assured.

Whether or not there is agreement on the existence of the problem, on the seriousness of it or on the methods advanced to meet it, there is one area on which there can be no argument and it is to this

issue that this editorial is directed. Our dental schools need the support of every Canadian dentist, in bringing not only ever greater numbers of applicants to faculty admissions committees, but ever greater numbers of really well qualified applicants.

It is discouraging indeed for a dentist sponsoring an applicant to learn that his candidate has been refused admission to a dental school. Each of us, however, recalls the difficulties and the demands of our own course and must appreciate that the school has a prime responsibility to admit only those whose predental academic background promises success in the dental course.

Not only, then, should each of us act as a private recruiting officer for our profession, but we should so guide and counsel our candidates as to courses to be undertaken and the necessity of maintaining good grades that there will be no question when the applicant reaches the admissions committee.

Our profession offers many rewards. One of the richest of these can be the personal satisfaction which comes to him who finding the candidate, grooms and guides him through the predental and dental student experience and then welcomes him as an equal and respected professional confrère.

J. McC.

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Fluoridation in Canada, 1963

La fluoration au Canada, en 1963

Bureau of Economic Research

Over two million Canadians, living in 129 communities, are drinking fluoridated water. Eleven per cent of Canada's population is now benefitting from this measure. This is an increase of 35 per cent

Plus de deux millions des citoyens du Canada, habitant 129 municipalités, consomment de l'eau fluorée. Onze pour cent de la population du Canada bénéficie de cette mesure de santé. Ces chiffres représentent une augmentation de 35 pour cent sur ceux de l'an dernier, à la même

All figures are as of January 1, 1963.
Statistiques au 1er janvier 1963.

TABLE 1 Municipalities with controlled fluoridation, January, 1963 • Municipalités qui fluorurent leur eau, au mois de janvier, 1963.

Province	Community Ville	Date started Début	Population	Total provincial population affected Population de la province touchée par cette mesure
Canada				2,077,000
Newfoundland Terre-Neuve				
Prince Edward Island Île-du-Prince-Édouard				
Nova Scotia Nouvelle-Écosse	Dartmouth	1956	45,500	171,500
	Halifax	1956	116,400	
	Kentville	1956	6,600	
	Wolfville	1959	3,000	
New Brunswick Nouveau-Brunswick				
Québec	Acton Vale	1960	5,000	290,200
	Beaconsfield	1955	10,000	
	Berthierville	1960	5,300	

TABLE 1 (cont'd.-suite)

Province	Community Ville	Date started Début	Population	Total provincial population affected Population de la province touchée par cette mesure
Québec (cont'd.-suite)	Candiac	1961	1,800	
	Chomedey	1958	30,000	
	Delson	1961	2,200	
	Dorval	1957	18,500	
	Duvernay	1958	11,000	
	Greenfield Park	1962	3,500	
	Joliette	1957	18,400	
	Joliette Sud		1,600	
	Lachute	1962	11,000	
	La Providence	1961	4,000	
	Laval-des-Rapides	1958	21,000	
	Le Moine	1962	3,500	
	Notre-Dame-des-Prairies		1,700	
	Pointe Claire	1955	20,000	
	Pont Viau	1958	17,500	
	Préville	1962	1,000	
	Rock Island	1958	1,700	
	St-Constant		3,900	
	St-Joseph-de- St-Hyacinthe	1961	3,600	
	St-Lambert	1962	17,000	
	St-Vincent-de-Paul	1958	10,000	
	Ste-Anne-de-Bellevue	1960	4,000	
	Ste-Catherine- d'Alexandrie		1,800	
	Ste-Rosalie	1961	1,200	
	Senneville	1960	1,500	
	Stanstead Plain	1958	1,400	
	Trois-Rivières	1962	57,100	
Ontario				681,100
	Brantford	1945	61,100	
	Brockville	1956	17,700	
	Burlington	1961	46,400	
	Cornwall	1962	43,200	
	Deep River	1952	4,800	
	Fort Erie	1952	8,900	
	Kirkland Lake	1962	16,000	
	North Bay	1962	41,000	
	Oshawa	1953	61,400	
	Parry Sound	1962	6,300	
	Perth	1962	5,700	
	Port Credit	1961	6,500	
	Renfrew	1962	8,500	
	Schumacher	1955	4,500	
	South Porcupine	1955	4,200	
	Streetsville	1962	4,900	
	Sudbury	1952	79,300	
	Swastika	1962	700	
	Thorold	1952	9,500	
	Toronto Twp.	1961	60,000	
	Wallaceburg	1962	10,000	
	Whitby	1962	15,000	
	Windsor	1962	165,500	

TABLE 1 (cont'd.-suite)

Province	Community Ville	Date started Début	Population	Total provincial population affected Population de la province touchée par cette mesure
Manitoba	Boissevain	1957	1,300	588,100
	Brandon	1955	28,200	
	Dauphin	1958	7,400	
	Killarney	1960	1,700	
	Minnedosa	1960	2,200	
	Portage la Prairie	1958	12,400	
	Steinbach	1960	3,700	
	Winnipeg Metro	1956	531,200	
Saskatchewan	Assiniboia	1953	2,500	227,200
	Birch Hills	1962	600	
	Blaine Lake	1961	600	
	Cabri	1961	700	
	Canora	1961	2,100	
	Carrot River	1961	900	
	Chaplin	1961	500	
	Davidson	1961	900	
	Estevan	1961	7,700	
	Eston	1957	1,700	
	Foam Lake	1962	1,200	
	Kamsack	1959	3,000	
	Kerrobert	1962	1,200	
	Kindersley	1959	3,000	
	Langenburg	1962	800	
	Langham	1962	400	
	Leader	1961	1,200	
	Leask	1962	500	
	Luseland	1961	700	
	Melfort	1962	4,000	
	Melville	1960	5,200	
	Montmartre	1960	500	
	Moose Jaw	1952	33,200	
	Naicam	1961	700	
	Plenty	1962	200	
	Preeceville	1961	900	
	Prince Albert	1960	24,200	
	Rosthern	1960	1,300	
	Rouleau	1962	500	
	Saskatoon	1955	95,500	
	Star City	1961	600	
	Sturgis	1962	700	
	Swift Current	1954	12,200	
	Tisdale	1960	2,400	
	Wadena	1961	1,300	
	Wakaw	1962	1,000	
	Watson	1961	900	
	Weyburn	1955	9,100	
	Whitewood	1962	900	
	Wynyard	1956	1,700	
Alberta				50,000
	Athabasca	1962	1,500	
	Bonnyville	1962	1,700	
	Devon	1959	1,400	

TABLE 1 (cont'd.-suite)

Province	Community Ville	Date started Début	Population	Total provincial population affected Population de la province touchée par cette mesure
Alberta (cont'd.-suite)				
	Fairview	1958	1,600	
	Fort Saskatchewan	1962	3,500	
	Grande Prairie	1959	9,100	
	Innisfail	1960	2,300	
	Leduc	1962	2,600	
	Red Deer	1958	21,100	
	St. Albert	1962	5,200	
British Columbia Colombie britannique				57,200
	Burns Lake	1960	1,000	
	Campbell River	1960	3,700	
	Kelowna	1956	13,300	
	Kitimat	1958	8,200	
	Lake Cowichan	1960	2,100	
	Mesachie Lake	1958	300	
	Prince George	1955	14,000	
	Prince Rupert	1957	12,100	
	Smithers	1955	2,500	
Northwest Territories Territoires du nord-ouest				6,600
	Fort McPherson	1962	500	
	Fort Smith	1961	1,700	
	Inuvik	1962	1,200	
	Yellowknife	1959	3,200	
Yukon				5,100
	Whitehorse	1961	5,100	

since the same time last year when 87 communities were fluoridating their water.

There are still no municipalities with controlled fluoridation in Newfoundland, Prince Edward Island and New Brunswick. In the seven provinces having some fluoridated municipalities, the percentage of the total population covered varies greatly — from 63 per cent in Manitoba to three per cent in British Columbia.

The provinces making the most progress during the past year were Ontario, Quebec and Alberta. These provinces have increased the population affected by 92 per cent, 74 per cent and 51 per cent respec-

époque, où 87 municipalités fluoraiement leur eau de consommation.

Il y a encore des provinces, Terre-Neuve, Ile-du-Prince-Edouard et Nouveau-Brunswick, où des villes ne fluoront pas encore l'eau de leur aqueduc. Les sept provinces, où des municipalités utilisent la fluoration, en font bénéficier leurs habitants dans des proportions très diverses: ainsi, en Colombie britannique, trois pour cent de la population consomme de l'eau fluorée, tandis qu'en Manitoba, 63 pour cent le fait.

Les provinces qui ont fait le plus de progrès durant l'année sont l'Ontario, le Québec et l'Alberta. Ces provinces ont respectivement augmenté la proportion de leur population qui bénéficie de la fluora-

TABLE 2 Increase in population and municipalities fluoridated, since 1962 • Augmentation de la population et des municipalités qui ont adopté la fluoruration depuis 1962.

Province	Percentage increase in population Pourcentage de l'augmentation de la population	Increase in number of municipalities Augmentation en nombre des municipalités
	%	No.
Newfoundland Terre-Neuve	—	—
Prince Edward Island Île-du-Prince-Édouard	—	—
Nova Scotia Nouvelle-Écosse	1.2	0
New Brunswick Nouveau-Brunswick	—	—
Québec	74.4	11
Ontario	92.2	12
Manitoba	10.7	0
Saskatchewan	5.8	12
Alberta	51.1	5
British Columbia Colombie britannique	1.6	0
Northwest Territories Territoires du nord-ouest	34.7	2
Yukon	2.0	0
Canada	35.3	42

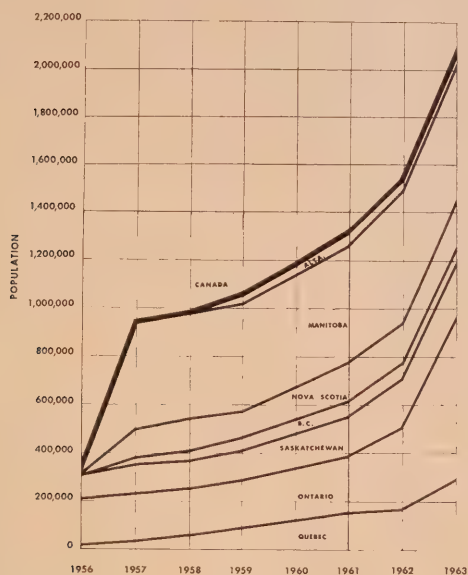


FIGURE 1 Progress of fluoridation. Population in fluoridated communities. • Progrès de la fluoruration. Population qui habite des villes où l'eau est fluorée.

TABLE 3 Per cent of total population in municipalities with controlled fluoridation, by provinces, 1963
 • Pourcentage de toute la population des municipalités qui fluorurent leur eau, par province, en 1963.

Province	Per cent Pourcentage	Province
Newfoundland	0.0	Terre-Neuve
Prince Edward Island	0.0	Ile-du-Prince-Edouard
Nova Scotia	23.0	Nouvelle-Ecosse
New Brunswick	0.0	Nouveau-Brunswick
Quebec	5.4	Québec
Ontario	10.7	Ontario
Manitoba	62.9	Manitoba
Saskatchewan	24.4	Saskatchewan
Alberta	3.6	Alberta
British Columbia	3.4	Colombie britannique
Northwest Territories	27.5	Territoires du nord-ouest
Yukon	34.0	Yukon
Canada	11.2	Canada

tively. Ontario and Alberta have made their gains by doubling the number of communities fluoridating their water supplies.

These figures are encouraging but the results of the 27 plebiscites held during 1962 are disappointing. Only one-third of these plebiscites were successful.

tion de 92, 74 et 51 pour cent. L'Ontario et l'Alberta ont réalisé leur progrès en doublant le nombre des villes utilisant cette mesure.

Ces statistiques sont encourageantes, mais 27 référendums tenus sur la question, au cours de l'année, ont donné des résultats décevants: seulement le tiers de ces référendums ont sanctionné la fluoration.

TABLE 4 Per cent of total population in municipalities with controlled fluoridation, 1956-1963
 • Pourcentage de toute la population des municipalités qui fluorurent leur eau, 1956-1963.

Year Année	Per cent Pourcentage
1956	2.1
1957	5.8
1958	5.9
1959	6.1
1960	6.0
1961	7.4
1962	8.4
1963	11.2

TABLE 5 Plebiscites held during 1962 * Referendums tenus en 1962.

Province	Community Ville	Votes cast Nombre de votes		Decision Résultat
		For — Pour	Against — Contre	
Newfoundland Terre-Neuve				
Prince Edward Island Île-du-Prince-Edouard				
Nova Scotia Nouvelle-Ecosse				
New Brunswick Nouveau-Brunswick				
Québec				
	St-Lambert			yes — oui
Ontario				
	Amherstburg	858	553	yes — oui
	Beaverton	69	422	no — non
	Belleville	2,956	3,744	no — non
	Chatham	2,132	3,299	no — non
	Fonthill	274	537	no — non
	Hamilton	25,435	43,872	no — non
	London	18,589	29,089	no — non
	Orangeville	320	1,266	no — non
	Ottawa	43,424	45,702	no — non
	Peterborough	6,510	8,748	no — non
	Prescott	754	436	yes — oui
	St. Catharines	3,378	13,248	no — non
	St. Thomas	2,431	4,238	no — non
	Sarnia	6,800	8,833	no — non
	Toronto	177,173	171,233	yes — oui
	Welland	5,182	3,787	yes — oui
	Windsor	18,961	12,906	yes — oui
Manitoba				
Saskatchewan				
Alberta				
	Camrose			no — non
	Jasper			no — non
	Jasper Place	56 %	44 %	no — non
	Milk River			yes — oui
	Pence River	80 %	20 %	yes — oui
	Rocky Mountain House			no — non
British Columbia Colombie britannique				
	Delta	1,595	1,539	no — non
	Fort St. John	493	304	yes — oui
	Revelstoke	218	825	no — non
Northwest Territories Territoires du nord-ouest				
Yukon				

Safe and effective methods for the use of the dental x-ray machine

Council on Research

The following statement was prepared in April 1963. It is a revision of previous statements on this subject by the Council on Research.

The value of the x-ray as a diagnostic aid in dental practice cannot be questioned. However, because of the increasing use of the x-ray, and because of the increased exposure of the public to radiation from other sources, the dental profession has an obligation to reduce the hazards in this connection wherever feasible.

Radiation hazards resulting from the use of the dental x-ray apparatus should be considered as they relate to both the operator and the patient. These dangers in each instance may take three general forms. First, with prolonged exposure the skin surface may be exposed to sufficient radiation to cause an erythema. Repeated exposure to a given area of skin over a long period of time may also cause pathological changes, which in turn could lead to the development of malignancy. This is of particular significance to the operator who is more likely to receive such damage than it is to the patient. Second, deeper tissues, particularly bone marrow and lymphatic tissue, may be affected adversely by the radiation resulting in a leukaemia or other blood cell disease. Third, radiation to the gonads may produce mutations within the developing germ cells resulting in harm to succeeding generations. All of these effects are directly proportional to the intensity and quality of the x-ray beam and to the length of time that the cells are exposed.

PROTECTION OF THE OPERATOR

The danger to the operator emanates from primary radiation caused by direct exposure to the x-ray beam and from secondary radiation scattered from the patient's face, the nose cone of the machine, or any other object exposed to the primary beam of radiation. Provided reasonable care is exercised the danger to the operator should be minimal.

The following precautions are necessary to protect the operator from the useful x-ray beam:

1. Never stand unprotected in the path of the useful x-ray beam.
2. Never use the fingers to hold a film pack in the patient's mouth while the x-ray machine is operating.
3. Never use intra-oral fluoroscopic mirrors.
4. Never hold the tube housing or the pointer cone while the x-ray machine is operating.

Exposure of the operator to scattered radiation can be markedly reduced by three methods:

1. Exposure to scattered radiation decreases with the distance the operator stands from the patient. The timer cord should be long enough to permit the operator to stand about ten feet from the patient while the machine is operating.
2. The safest position for the operator during the exposure of dental film is

approximately at a right angle to the direction of the x-ray beam.

3. If these precautions cannot be followed, or if the daily work load is particularly heavy, the operator should stand behind a leaded barrier.

(To check on the effectiveness of precautions used for his own protection, the operator may wear a film badge as supplied by the Radiation Protection Division, Department of National Health and Welfare, Ottawa.)

PROTECTION OF THE PATIENT

When proper techniques are used the danger of producing an erythema to the patient's skin or damage to germ cells is remote. It should be noted, however, that there is no known threshold for producing mutations in the developing germ cell. For this reason every effort should be made to reduce exposure to a minimum. Potential danger to the patient also exists with repeated and prolonged exposure to x-rays of the blood-forming cells of the bone marrow and lymphatic tissues. For this reason the areas radiated for dental investigation should be kept small so that only a fraction of the total blood cell forming tissues are exposed. With proper technique the exposure to any one area should neither be prolonged nor intense.

By adopting the following precautions, exposure of the patient to unnecessary radiation can be reduced significantly:

1. A lead diaphragm should be placed between the x-ray beam source and the patient to ensure that the area of skin surface radiated at each exposure is not more than 2.5 inches in diameter. With such a device there is a significant reduction in the amount of primary and scattered radiation to which the patient is exposed. Recent investigations suggest that a fully collimated cone will further reduce the total scattered radiation.

2. Filters of pure sheet aluminum should be placed between the x-ray beam source and the patient to yield a total filtration equivalent to 2 mm. of aluminum. This procedure will reduce the skin dose by absorbing most of the soft radiation from the beam. Soft radiation does not penetrate far enough to be of use from a radiographic standpoint, but it does add to the skin dose.

3. The operator should use the fastest film available, compatible with obtaining radiographs of high quality. Since some very fast films require only one-sixth the exposure time of slower speed films, an appreciable reduction in total patient exposure can be realized. A fully-controlled time and temperature developing technique must be used in conjunction with fast films to permit the best results. This usually means increasing the developing time to five minutes at 68° F. with high energy developer. Any reduction in developing time will necessitate increasing the exposure time. When ultra-fast films are used it is necessary to replace the mechanical timer on the x-ray machine with an accurate electronic timer.

4. It is generally considered that operating techniques should utilize the higher (60 Kvp to 90 Kvp) rather than the lower kilovoltages.

5. The problem of x-ray leakage from the housings of modern x-ray machines is very slight. With older x-ray machines which might have inadequate or faulty shielding in the tube housing, this leakage can be significant. Radiation from this source can be detected by means of radiation instruments or films. (Radiation detection services are available through most of the provincial health departments.)

6. The use of a leaded apron on the patient is recommended as a simple means of protecting the gonads from secondary radiation.

Fluoride supplements for prevention of dental caries

Council on Research

The following statement was prepared in April 1963. It is a revision of previous statements on this subject by the Council on Research.

1. Adjustment of the fluoride content of communal waters to a level of 1 part per million is a safe and effective public health measure for the prevention of dental caries. At present, no alternative method of fluoride administration competes with the above in terms of safety, effectiveness and cost.

2. Where communal water supplies do not exist or where water supplies contain less than 0.7 ppm of fluoride, concentrated fluoride supplements are recommended.

3. Concentrated forms of fluoride may be used at home for preparing fluoridated water containing 1 ppm of fluoride. The use of this water for drinking, infant feeding formulae, and cooking should simulate the effects of communal water fluoridation.

4. An alternative method is to administer daily fluoride tablets or concentrated solutions in water according to an established age-dose scale. Details may be obtained from the secretary of the Canadian Dental Association.

5. The presence of concentrated fluoride tablets or solutions in the home constitutes a potential danger from acute poisoning. As with many pharmaceutical agents, fluoride tablets or concentrated solutions should be provided only on prescription by a qualified dental or medical practitioner, only after the fluoride content of the home water supply has been ascertained, and only where continuous parental supervision can be assured over a period of many years.

6. Preparations containing fluorides and vitamins are not recommended, since control over the administration of the single constituent would become more difficult. Also, the hazards resulting from abuse are compounded if a multiple preparation is involved.

Objectives of Education • "We cannot achieve an educational philosophy in Canada until we begin to work together in a spirit of tolerance toward unity with diversity within a typically Canadian context of duality of races and cultures."—Rt. Rev. Father Henri Légaré.

dentistry in the news

The Association

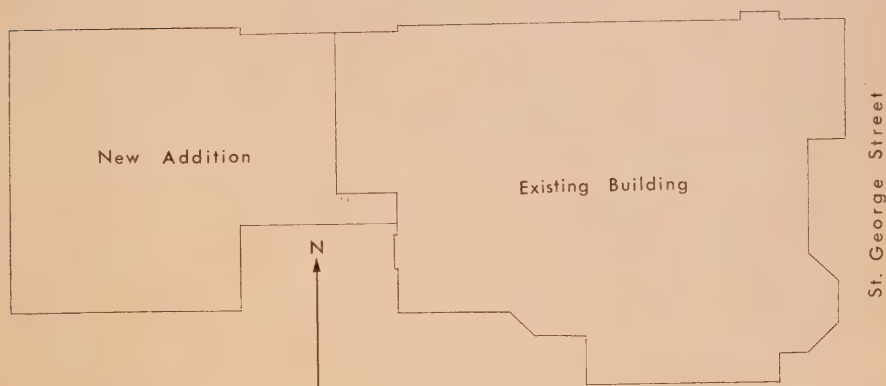
CONSTRUCTION OF HEAD- QUARTERS ADDITION STARTS

Construction of a three-storey addition to the Association's headquarters building began May 6. The addition was approved by the Board of Governors a year ago but zoning and other municipal problems delayed the issuance of a building permit.

The addition will be located at the rear

of the present building and joined by a connecting stairwell. The addition will have its own heating plant and other utilities, not connected with the older building. The present headquarters building is a former residence which was purchased and renovated in 1950 by the Canadian Dental Association.

The main feature of the new wing will be the boardroom, about 30 feet square. The present boardroom, which has been outgrown, will be converted to library use. Printing facilities will be moved to the main floor of the new wing. The second floor will contain the new boardroom and offices for the Association's secretary and his secretary. The third floor, although not to be finished completely, will be used as additional office space. The headquarters property, which is almost 200 feet in depth, will allow for parking behind the new building.



Construction of the new extension to the Association's headquarters building in Toronto began early in May. The above diagram indicates the position of the new extension immediately to the west of and behind the existing headquarters building on midtown St. George Street.

HYGIENISTS' AND ASSISTANTS' PROGRAMS DISCUSSED

Schools of dental hygiene and dental assistants' courses were among the topics for discussion at the meeting of the Council on Education, held March 21-22 at Association headquarters in Toronto.

The Council also received an interim report on the feasibility of establishing a central slide library at Association headquarters.

Approval was given to a report which recommended a short program of lectures and demonstrations in the principles of physical examination for undergraduate students. More extensive training in this field was considered impractical and undesirable.

receive dental care. Last year, the government grant amounted to \$302,982.00 and the plan showed a deficit of \$15,616.00.

The deficit was largely due to the particularly high cost of the child welfare group. The deficit for this part of the program alone was \$12,933.00. The Alberta Dental Association estimates it would need a monthly grant of 88 cents per child to cover this group.

In 1961, the utilization rate for all groups of pensioners covered by the dental plan was only 21 per cent. For the children's group, however, it was 56 per cent.

International Items

Canada and the Provinces

ADMONISH DENTISTS WHO WITHHOLD RECEIPTS FROM PATIENTS

Federal and provincial laws give every taxpayer the right to claim an income tax deduction on production of medical receipts, says R. M. LeBlanc, registrar-secretary of the College of Dental Surgeons of the Province of Quebec, in an editorial in the April issue of *Information*. Noting the increasing number of complaints about dentists who refuse to issue receipts to patients, particularly when annual income tax returns are due, Dr. LeBlanc warns that this practice is intensely irritating to patients and places the whole profession in a bad light. Moreover, says Dr. LeBlanc, patients may deposit official sworn protests and photostats of cheques they have issued with the income tax authorities. Such action will sooner or later result in investigation of the offending dentists by the authorities.

ALBERTA DENTAL WELFARE PLAN RECORDS DEFICIT

The cost of providing dental services to welfare recipients in Alberta exceeded the moneys allocated by the provincial government for this purpose during 1962. Dental treatment provided through the Alberta Dental Association cost \$297,394.00. Administrative costs amounted to a further \$21,204.00. The Alberta Dental Association receives only 45 cents a month per person eligible to

TEMPLE UNIVERSITY HONOURS DR. GULLETT

Canadian Dental Association secretary Don. W. Gullett was the recipient of an honorary degree from Temple University, Philadelphia at a ceremony marking the American school's 100th anniversary celebration on May 1. Others similarly honoured were H. H. Freihofer of Zürich, Switzerland, speaker of the General Assembly of the Fédération Dentaire Internationale; T. J. Hill, eminent Cleveland, Ohio oral pathologist; Harold Hillenbrand, secretary of the American Dental Association, G. H. Leatherman of London, England, secretary general of the Fédération Dentaire Internationale; and R. H. W. Strang, prominent Bridgeport, Connecticut orthodontist.

Immediately following the convocation, Dr. Gullett participated with Drs. Freihofer, Hillenbrand and Leatherman in a discussion on "The International Image of Dentistry."

SURVEY DENTAL STATUS OF YOUNG ADULTS IN NEW ZEALAND

A dental survey of a representative cross section of the sixteen to twenty-one-year-old population in New Zealand is being undertaken by the Division of Dental Health, New Zealand Department of Health in order to determine the dental health status of this age group after they cease to be eligible for general dental benefits under the New Zealand school and adolescent dental service. The survey, which commenced in August 1962, will take about a year to complete and will involve 2,000 to 3,000 people from all over New Zealand. Factories, of-

fices, and stores are chosen at random and all members of the staff aged 16-21 who are willing to co-operate are examined. Each examination comprises a mouth mirror and explorer examination for dental caries, restorations placed, restorations required, missing teeth, calculus, oral hygiene, enamel hypoplasia and dentures required and worn. Six radiographs are taken for each patient and a short questionnaire on past dental treatment is completed.

The results of the survey are expected to yield a complete picture of the dental health of sixteen to twenty-one-year-old New Zealanders. It will also provide an assessment of the long-range effectiveness of services provided for children under the school dental service and general dental benefits.

NOTED AMERICAN DENTAL HISTORIAN DIES

G. B. Denton of Evanston, Illinois, internationally known authority on dental history and literature, died on March 9 at the age of 78. Dr. Denton spent over forty-five years in research in the history of dentistry. During the last fourteen years he was a research consultant for the American Dental Association. The author of many articles on dental history and terminology, he is perhaps best known for his book, *The Vocabulary of Dentistry and Oral Science* which was published in 1958. At the time of his death, Dr. Denton was completing work on a book on the history of dentistry in the United States and western Europe.

VARIOUS SCIENTIFIC MEETINGS SCHEDULED IN THE UNITED STATES

The following meetings of groups interested in dental implants, endodontics, gold foil restorations and oral biology have been scheduled for October:

The Third International Conference on Endodontics will be held in Philadelphia at the University of Pennsylvania School of Dentistry, October 8-11. The main topics to be considered will be the treatment of deciduous teeth, culturing of root canals, filling of root canals, and restoration of the total tooth.

Atlantic City, New Jersey will be the site of the Fourth Annual International Seminar on Implants in Dentistry, October 10-13. Information concerning this meeting may be obtained from A. N. Cranin, 2120 Ocean Avenue, Brooklyn 29, New York, U.S.A.

The next meeting of the American Academy of Gold Foil Operators will be held at

the Baltimore College of Dental Surgery of the University of Maryland, October 11-12. Information concerning this meeting may be obtained from H. A. Merchant, 1229 Medical Arts Building, Omaha, Nebraska, U.S.A.

Palm Springs, California is the locale of the 20th Annual Meeting of the American Institute of Oral Biology, October 21-25. Information and application forms may be obtained from the executive secretary, Mrs. Marion Lewis Meyer, 260 San Leandro Way, San Francisco 27, California, U.S.A.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY OFFERS GRADUATE TRAINING PROGRAM

The Massachusetts Institute of Technology will offer a program of graduate training in the sciences fundamental to research in "oral science," leading to the doctor of philosophy degree, effective September 1963. Candidates will be accepted on the basis of academic record, research promise and interest in an academic and research career in oral science. Stipends for dental graduates start at \$6,500 per year, with allowance for experience and dependants. Further information is available from N. S. Scrimshaw, Department of Nutrition and Food Science, Massachusetts Institute of Technology, Cambridge, Massachusetts, U.S.A.

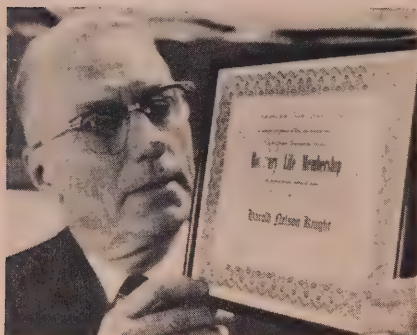
CHILDREN'S DENTAL HEALTH SURVEY IN UNITED STATES

A dental examination will be included in a health survey of American children, ages 6-11, to be conducted by the United States Public Health Service in July. About 8,000 children will be invited to undergo the health examination given in mobile examination centres. This program is part of the National Health Survey authorized by the American Congress to gather facts about the health status of the American people.

Dental Organizations

OHIO STATE PROFESSOR ADDRESSES EDMONTON DENTISTS

Victor Steffel, professor and chairman of the Division of Removable Partial Dentures at



Recently honoured with a life membership by the Edmonton and District Dental Society was H. N. Knight who has practised for forty years in the Alberta capital.

Ohio State University, addressed members of the Edmonton and District Dental Society at the group's April meeting. Preparation of the teeth and soft tissues prior to the taking of impressions, making impressions and casts, surveying teeth and casts, designing the denture and the clasps, and the relining of partial dentures were the subjects covered by Dr. Steffel.

During his visit to Edmonton, Dr. Steffel also presented a two-day seminar to the Edmonton Prosthodontic Study Group.

B.C. COLLEGE ELECTS

Elections for members of the Council of the College of Dental Surgeons of British Columbia took place on April 15 when the following were chosen to represent the five

electoral districts of the province: A. Day-smith and B. Kjekstad of Victoria, W. G. Newby of Chilliwack, W. P. Munsie, J. G. Ryan, D. H. Warren and D. J. Yeo of Vancouver, L. E. English of Kamloops and W. N. Fraser of Creston. The new Council will assume office in July for a period of two years.

Courts of enquiry were held recently on two British Columbia dentists who collaborated with dental mechanics. They were charged with extracting teeth when they did not have reason to believe that the prosthetic appliances would be fitted and adjusted by a person registered under the Dentistry Act. In both cases the dentists were found guilty and suspended from practice for one month.

VANCOUVER LIFE MEMBERS HONOURED

Three new life members were honoured at the March meeting of the Vancouver and District Dental Society: W. A. Loveridge, G. L. Plant and M. M. Johnson. They have been in practice for over 45 years and have been society members for at least 20 years. The citations were given by C. M. Whitworth, who pointed out that payment of dues alone is not sufficient to qualify for life membership. Candidates must also have rendered active service to their dental society.

WINNIPEG DENTISTS HONOUR GRADUATING DENTAL ASSISTANTS

Eighteen dental assistants were guests of the Winnipeg Dental Society at a luncheon meeting held on April 22 at the Royal Alexandra Hotel. They were the successful graduates of

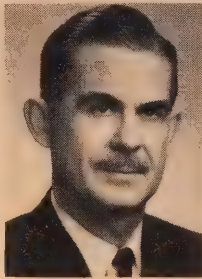


Attending the convention of the (British Columbia) Interior Dental Society held earlier this year in Penticton are (l. to r.) M. J. T. Dohan, immediate past president, B.C. Dental Association; M. V. J. Keenan, immediate past president, Canadian Dental Association; D. W. Gullett, secretary, Canadian Dental Association; and W. P. Munsie, president of the Council of the B.C. College of Dental Surgeons. Drs. Keenan and Gullett were in Penticton during the C.D.A. president's annual western tour.

the fourth annual course for dental assistants sponsored by the society and by the Faculty of Dentistry of the University of Manitoba. Diplomas and pins were presented by W. G. Campbell, co-ordinator of the course.

J. W. Neilson, dean of the Faculty of Dentistry, University of Manitoba, was the moderator at a symposium on pain control at the society's April meeting. Other participants included: Ian Thompson, head of the Department of Anatomy; George Sisler, head of the Department of Psychiatry; and I. R. Innes, of the Department of Pharmacology. The panel gave a comprehensive review of pain in all its aspects, including anatomical and psychological factors and the suppression of pain by the use of drugs. In a subsequent presentation W. R. Schram, professor of oral surgery at the University of Manitoba, discussed practical applications of pain control and helpful procedures for the general practitioner.

NEW EXECUTIVE FOR ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO



W. G. Bruce

W. G. Bruce of Kincardine was recently elected president of the Royal College of Dental Surgeons of Ontario, succeeding A. H. Leckie of Hamilton. Dr. Bruce holds the position that his father, E. E. Bruce, occupied from 1925 to 1927.

J. P. Coupland, a prominent Ottawa oral surgeon, was named vice-president. Dr. Coupland is also a member of the Executive Council of the Canadian Dental Association.

Other directors are R. C. Honey of Peterborough, A. B. Sutherland of Sudbury, H. M. Jolley of Toronto, D. J. Ferguson of London, Ralph Michell of Kitchener, A. H.

Leckie of Hamilton, and J. D. Purves of Toronto representing the Faculty of Dentistry, University of Toronto. W. J. Dunn is registrar-secretary-treasurer.

HIGH SCHOOL STUDENTS VISIT TORONTO DENTAL SCHOOL

A group of high school students from the areas of the North Bay Dental Society and Muskoka-Simcoe Dental Society visited the Faculty of Dentistry, University of Toronto and attended a dinner in Hart House on April 18. W. J. Dunn, registrar-secretary of the Royal College of Dental Surgeons of Ontario addressed the visitors in Hart House. The visit was sponsored by the Recruitment Committee of the Ontario Dental Association's Dental Public Health Committee.

MONTREAL UNIVERSITY RECEIVES GRANT FROM QUEBEC COLLEGE OF DENTAL SURGEONS

A grant of \$3,500 to the Faculty of Dental Surgery, Université de Montréal, was recently authorized by the Board of Governors of the College of Dental Surgeons of the Province of Quebec. The money will be used to purchase equipment in connection with research studies being undertaken at the Montreal Dental School.

MONTREAL ALPHA OMEGA DENTISTS REPORT ACTIVITIES

Three members of the Montreal Chapter, Alpha Omega Fraternity participated in the group's annual clinical demonstration evening in February. Demonstrating a method of permanently sealing an anterior root canal with a combination of silver point and gutta percha was Benjamin Sedlezky. Edward Slapcoff described a simple method of fraenectomy to facilitate orthodontic closure of an exterior diastema. David Solomon, the third clinician, gave an explanation of the equipment and procedures he uses for intraoral photography.

Louis Grossman of Philadelphia, the internationally known endodontist, was the guest lecturer and clinician at the annual all-day lecture and seminar, March 8-10. On March 8 Dr. Grossman discussed endodontics in general terms. On March 9 and 10 he led a limited attendance seminar devoted to techniques of endodontic treatment.

INDIANA UNIVERSITY PROFESSOR ADDRESSES MONTREAL DENTAL CLUB

The March meeting of the Montreal Dental Club was addressed by J. F. Johnston, professor and chairman of the Department of Fixed and Removable Partial Prosthesis at the School of Dentistry of Indiana University.

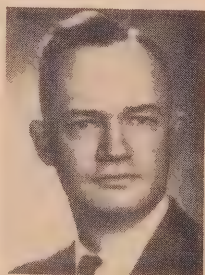
Dr. Johnston's topic for the afternoon session was veneer crowns. He discussed resin and ceramic veneers and demonstrated how tooth preparation and laboratory techniques must be varied according to the material used.

At the evening session Dr. Johnston, in his address on "Aesthetics in Bridge Construction," stressed the importance of recognizing and duplicating the anatomical features of the patient's teeth. Some of the problems involved in attaining proper shades in colour in both acrylic and porcelain veneers were also discussed.

Introduced as new members of the Montreal Dental Club at this meeting were R. David and H. Baffi.

TORONTO ACADEMY ELECTS NEW COUNCIL

R. M. Grainger, professor of Dentistry (Statistics) at the University of Toronto, was installed as president of the Academy of Dentistry, Toronto for the year 1963-4 at the organization's annual dinner meeting on April 3. Inducted with Dr. Grainger were the following officers: J. H. Mullett, past president; J. E. Carson McGowan, presi-



R. M. Grainger

dent-elect; Murray Cornish, secretary; and M. G. Hardy, treasurer. Named as councillors — two representatives from each of the

Academy's four electoral districts — were T. A. Fisher and G. C. Stirling, Central Toronto; A. Doyle Smith, East Toronto; B. J. Levin and W. J. McColeman, North Toronto; and J. R. Glenny and W. G. Jarjour, West Toronto.

HALIFAX DENTISTS ATTEND CLINICAL MEETINGS

The March and April meetings of the Halifax County Dental Society were devoted to clinical sessions on operative dentistry and pharmacology. Ronald Jordan, professor of Operative Dentistry at Dalhousie University dental school, discussed cavity preparation and amalgam restorations at the March meeting. J. G. Aldous, professor of Pharmacology at Dalhousie University medical school, discussed pre- and postoperative sedation at the April meeting.

The society will institute a course for dental assistants beginning in September. This course, given under the auspices of the Nova Scotia Dental Association, will consist of twice weekly lectures and demonstrations.

Canadian Dental Schools

UNIVERSITY OF ALBERTA

Graduate Study Programs. — Appointments are now available in the Faculty of Dentistry, University of Alberta, for dental graduates who are interested in research and graduate study. Candidates who are accepted for admission to the Faculty of Graduate Studies may prepare for the M.Sc. degree. The active research interests of the staff include:

Anatomy: growth and development; calcification and decalcification; mammalian cell and organ culture.

Biochemistry: absorption and metabolism of calcium and phosphorus; glyco-proteins and iron metabolism of tumour-bearing animals; enzymes of the gastrointestinal tract.

Dental materials: experimental swaging, stress analysis of patterns and castings; dispersion hardening of dental amalgams; toxicity studies on newly developed restorative materials.

Microbiology: animal cell culture; virology; bacteriology; immunology.

Dental public health and epidemiology: growth patterns of young children; fluoride intake; topical fluoride; administration of public health programs.

Architect's model of the Health Sciences Centre now under development at the University of British Columbia. At the centre of the picture is the proposed 410-bed University Hospital. At its base are the psychiatric units on the left and the outpatient department on the right. In the right foreground is the proposed location of the Faculty of Dentistry. Other buildings include the four existing medical sciences buildings, the proposed Woodward Library and a tower to be developed for future research needs.



Clinical dentistry: paediatric dentistry including interceptive orthodontics and treatment of handicapped children.

In addition, programs leading to the M.Sc. and Ph.D. degrees can be arranged in various basic science departments. Fellowships and assistantships are available. Applications may be submitted at any time throughout the year. Further detailed information may be obtained from the Chairman, Committee on Graduate Studies, Faculty of Dentistry, University of Alberta, Edmonton.

UNIVERSITY OF TORONTO

Staff Members Attend Research and Education Meetings—S. Adu-Aryu, R. C. Burgess, J. G. Dale, M. Hunt, N. Levine, E. Madlener, G. Nikiforuk, K. J. Paynter and C. H. M. Williams attended the forty-first annual meeting of the International Association for Dental Research in Pittsburgh, March 21-24. Several reports of research projects being undertaken in the division of dental research were presented at this meeting.

P. G. Anderson was a participant on the program of the fortieth annual meeting of the American Association of Dental Schools in Pittsburgh, March 24-27. Other members of the staff who attended the meeting were R. G. Ellis, R. M. Grainger, M. Jackson, J. H. Johnson and K. J. Paynter.

Staff Member to Lecture in Australia.—G. T. Hare, associate professor of Endodontics, will be a guest lecturer of the Australian Dental Association this year. Dr. Hare presented a two-day course in Sydney, May 30-31.

Recruitment.—Members of the staff associated with the student recruitment program of the Ontario Dental Association include S. A. MacGregor and G. T. Mitton. Dr. MacGregor addressed a dinner meeting sponsored by the North Bay Dental Society and the Muskoka-Simcoe Dental Society on March 27 and 28 respectively.

National Research Council Grants Awards.—The Associate Committee of Dental Research of the National Research Council of Canada has announced awards to the following staff members of the Faculty of Dentistry: G. Nikiforuk, \$5,000; J. G. Dale, \$4,000; A. M. Hunt, \$8,000; K. J. Paynter, \$8,000; and R. M. Grainger, \$7,000. These awards are in support of research studies being directed by the aforementioned staff members.

Royal Canadian Dental Corps

DUTY TRIPS AND VISITS

Brigadier K. M. Baird, Director General of Dental Services for the Canadian Forces, interviewed candidates attending courses at the Royal Canadian Dental Corps School on March 7 and 8. Subsequently Brig. Baird visited Montreal for the annual inspection of No. 15 Dental Company. Accompanied by the commanding officer, Lt.-Col. J. G. Butler, he

visited clinics in the Montreal area. In April Brigadier Baird made the annual inspection of Royal Canadian Dental Corps units overseas in France and Germany. His itinerary provided the opportunity to visit both No. 35 Field Dental Unit, commanded by Lt.-Col. L. G. Craigie and No. 4 Field Dental Company, commanded by Lt.-Col. G. C. Evans.

Colonel C. E. Purdy, Commandant of the R.C.D.C. School, attended the annual meeting of the Canadian Dental Association's Council on Public Health in Toronto, February 20-21. Col. Purdy informed the Council concerning preliminary findings of the "Dental Team Study" currently being conducted at R.C.A.F. Station Camp Borden. The purpose and methodology of this study were described in an article in the October 1962 issue of the *Journal of the Canadian Dental Association*.

Lt.-Col. G. R. Covey, Deputy Director of Dental Services, is the inspecting officer for the Militia General Efficiency Competition for the current year. During his extensive tour he visited the following units which are taking part in this year's competition: No. 51 Dental Unit, Saint John, commanded by Lt.-Col. H. F. Bonnell; No. 53 Dental Unit, Montreal, commanded by Acting Major S. J. Gouroff; No. 54 Dental Unit, Ottawa, commanded by Lt.-Col. H. J. Chartrand; No. 56 Dental Unit, Toronto, commanded by Acting Lt.-Col. M. C. Parks; No. 57 Dental Unit, Winnipeg, commanded by Lt.-Col. M. J. Snidal; No. 60 Dental Unit, Edmonton, commanded by Lt.-Col. S. G. Geldart; and No. 61 Dental Unit, Vancouver, commanded by Lt.-Col. P. L. Rondeau.

WANSBROUGH TROPHY PRESENTED

A team from the No. 1 Dental Equipment Depot won top honours in the bonspiel at Camp Borden on March 9 when twelve rinks competed for the Wansbrough Trophy. Making the presentation was the donor of the trophy, Brigadier E. M. Wansbrough. Second and third place awards went to rinks representing the Royal Canadian Dental Corps School while a team from London, Ontario representing No. 13 Dental Company won the consolation award. These presentations were made by Brigadier K. M. Baird.

CORPS WELCOMES NEW OFFICER

Capt. I. M. Hamilton, a former member of No. 50 Dental Unit who graduated from Dalhousie University in 1955, has been called out on continuous army duty and posted to H.M.C.S. Shearwater.

Col. D. W. Henry of Montreal is another senior officer of the R.C.D.C. militia. A member of the Advisory Dental Staff, Col. Henry is also a Queen's Honorary Dental Surgeon.



DIRECTORATE OFFICER ATTENDS MANAGEMENT COURSE

Lt.-Col. D. H. Hillier, Dental Public Health Officer, attended a course in arrow diagramming at the Royal Canadian School of Military Engineering, Camp Chilliwack, B.C., April 1-17, 1963. The course provides instruction in the critical path method of management planning and control.

Public Health

WINNIPEG DENTAL NURSES AID HANDICAPPED CHILDREN

Eighteen volunteer dental nurses and assistants are helping to improve the oral health of handicapped children in Winnipeg. The youngsters are pupils at a special school operated by the Manitoba Association for Retarded Children. The project is one result of a three-year study of the needs of these children made by the dental division of the Winnipeg health department. With financial support from the Manitoba Dental Nurses' and Assistants' Association, a committee headed by Mrs. Dorothy Stagmire of Winnipeg provides toothbrushes and toothpaste to the school. Older pupils, under the direction of the manual training teacher, have made special toothbrush racks for each classroom.

The 18 volunteer dental nurses and assistants visit the school in rotation once a week to give toothbrush instruction. Welcomed by parents and teachers, the project has also received favourable press publicity.

The dental division of the Winnipeg health department was also successful in providing treatment to these children through a centre where private practitioners may acquire ex-

perience in treating handicapped children. This has resulted in a group of practitioners who accept these children and are a resource to which referrals can be made.

PUBLIC HEALTH DENTISTS ATTEND C.P.H.A. MEETING

Public health dentists from various parts of Canada attended the annual meeting of the Canadian Public Health Association in Winnipeg, May 27-30. J. M. Dunning, assistant clinical professor of public health dentistry at Harvard University, was the principal dental speaker at a general session of the association. J. J. Schachter of Saskatoon and A. E. Chegwin of Regina, who recently visited New Zealand as members of a mission sent by the government of Saskatchewan, described that country's dental nurse plan at a meeting of the dental section. G. T. Mitton, professor of dental public health, University of Toronto, was a dental participant at a mixed panel on dental health education.

Dentists attending the meeting were entertained by the Public Health Committee of the Manitoba Dental Association at an informal luncheon on May 29.

MOUTH PROTECTOR PROGRAM IN VANCOUVER

D. J. Yeo, director of Metropolitan Dental Health Services in Vancouver, has embarked on a mouth protector program for two high school football teams in Vancouver. The mouth guards used will be evaluated as to comfort, sanitation, and degree of use by the players, as well as economic cost, and the safety factors involved.

PERSONNEL IN THE NEWS

F. McCombie, director of the Division of Preventive Dentistry, British Columbia Health Branch, has been invited by president J. B. Macdonald of the University of British Co-

lumbia to serve on an *ad hoc* advisory committee to assist Dean S. W. Leung in the development of the new Faculty of Dentistry. On this committee, in addition to the president and the dean, will also serve D. J. S. Sutherland of the College of Dental Surgeons of British Columbia, Dean F. McCreary of the Faculty of Medicine, G. M. Volkoff of the Department of Physics, and K. D. Naegle who is associate professor of sociology.

W. King, who last year completed his course in dental public health at the School of Hygiene, University of Toronto, has assumed direction of No. 2 Region, Dental Health Division, Manitoba Health Department, with headquarters in Brandon. O. Heschuck, a recent graduate of the Faculty of Dentistry, University of Manitoba, has also joined the provincial Health Department.

D. G. Brett-Williams, director of Dental Services for Newfoundland, is presently on educational leave and is taking a two-year course in orthodontics in England. During his absence, J. E. Russell is acting director of Dental Services.

M. Poplove, research dental officer of the Department of National Health and Welfare, returned to the department last year from educational leave after having spent almost two years at the Graduate School of Medicine of the University of Pennsylvania, and at the Division of Graduate Studies of the School of Medicine, Boston University.

FINAL SURVEY AT BRANTFORD, STRATFORD AND SARNIA

The final round of surveys in the Brantford-Stratford-Sarnia study of the dental effects of water fluoridation are now being carried out by the Dental Health Division, Department of National Health and Welfare.

The sixteen and seventeen-year-old native school populations of these three cities are being examined, i.e., those who will be at least sixteen years old but under their eighteenth birthday on June 30, 1963. This final survey will mark the end of a statistical study which commenced in 1948.

Fluoridation • Dentists have an obligation to convince their patients that fluoridation can reduce dental caries safely and inexpensively by about two-thirds.

book reviews

DENTAL JURISPRUDENCE

Harvey Sarnier. Philadelphia and London, W. B. Saunders Co., 1963. (Available from McAinsh & Co., Toronto and Vancouver) 156 p. \$5.40

The author does not deal with the relationship of the dentist to his profession, but rather confines his work to the relationship between dentist and patient.

The text holds the interest of the reader throughout; it is well written, uses simple, direct English and is divested of all extraneous material so common in a book of this type.

One naturally is hesitant regarding the value of an American text in relation to Canadian jurisprudence. Consequently examination of this work included a review by a competent legal counsel well versed in Canadian law affecting dentistry. His comment reads as follows: "It is an excellent book to give the dentist a general understanding of the law as it relates to his practice. It is of considerable use to the Canadian dentist since the law of tort and contract is essentially the same in both the United States and Canada. The state laws and special statutory laws of course would not apply to Canadian practice."

It might seem strange that one could become enthusiastic over a reference work with this title, but the attributes of this concise text are such that it can be highly recommended for any dentist who conscientiously uses his personal library.

W. Ross Upton

OPERATIVE DENTAL SURGERY

W. E. Herbert and W. A. Vale. Ed. 8. London, Edward Arnold (Publishers) Ltd., 1962. (Available from the Macmillan Company of Canada, Ltd., Toronto) 523 p. Illus. \$11.70

The eighth edition of *Operative Dental Surgery* covers in a superficial manner such broad subjects as practice management, oral diagnosis, cavity preparation, amalgam procedure, gold foil technique, crown and bridge procedures, endodontics, and treat-

ment of fractured teeth. There is even a chapter on extraction.

Many of the techniques suggested do not correspond with current techniques taught in Canadian dental schools. While new material has been added to this revised edition, some chapters leave the reader feeling that very little of the outdated content has been removed.

Because of the broad scope of this book, none of its many subjects are covered exhaustively, and its value would be appreciated only by the dental novice.

D. B. McAdam

THE DENTIST'S HANDBOOK ON LAW AND ETHICS

W. R. Tattersall, H. D. Barry and E. Eden. London, Eyre & Spottiswoode, 1962. 325 p. Illus. £1 17s. 6d.

In dentistry there are very few books which are not worth at least reading. This text should be read as it gives an insight into what might be expected under a National Health Service as in Britain.

In this country at the present time every political party is advocating some form of health insurance. Whether this stems from political expediency or not does not matter too much. Promises of this nature must be implemented to keep faith with the electorate who are capable of keeping a party in office or rejecting it for some other party with a more plausible plan. We must be prepared within the next few years to accept a plan probably comparable to the National Health Service in England, regardless of which party is in power. A study of this text gives the dentist some indication of the ramifications of such a plan, and acquaints him with its limitations as a complete health service, as well as how his freedom might be curtailed under such a plan.

This book points out very clearly how the plan operates with regard to the practice of dentistry, how the dentist is registered and licensed, and what his privileges are under this licensure. It outlines the responsibility of the dentist to the public and how both are protected under British law. The chapter dealing with negligence is very interesting,

and because of the similarity of the law in Britain and Canada most of the decisions handed down by British courts would probably run parallel with those handed down in Canadian courts.

In this country dentists have had the impression that the individual freedom of the British dentist is somewhat curtailed. One does not find this to be so in reading this book, as the ethical principles known in our practices have been well maintained under the National Health Service.

The final three chapters of this text do not come within the scope of the title and could probably be omitted without detracting from the text.

Because of the similarity of most health plans proposed by governments and because we are on the threshold of having such a plan initiated in Canada, it would be imprudent for dentists to remain ignorant of the workings of such a plan. Such knowledge is vital if dentists are to discuss the subject intelligently, and compromise, if need be, on issues rather than principles.

J. P. McGuigan

ADHESIVE RESTORATIVE DENTAL MATERIALS

R. W. Phillips and Gunnar Ryge. *Proceedings from a workshop at the Indiana University Medical Center sponsored by the Dental Study Section, National Institutes of Health, and supported by a grant from the National Institute of Dental Research.* Spencer, Indiana, Owen Litho Service, 1962. 216 p.

This is a paper-back summary of proceedings of a workshop sponsored by the National Institutes of Health (Dental Study Section) of the U.S. Department of Health, Education and Welfare. The publication is edited by R. W. Phillips of the University of Indiana and Gunnar Ryge of Marquette University.

One is impressed by the many contributors from fields which are not dental and which are not commonly thought of as being even remotely associated with the profession. Most of these contributions are of a purely scientific nature and would be of much greater interest to the scientist than the clinician.

The interested clinician will be impressed by the depth and detail with which scientific investigation is probing into enamel and dentine both physically and chemically. The first of three sections is devoted to this subject. It is followed by a section entitled "The Principles of Absorption and Adhesion in an Aqueous Environment" and a third

entitled "Materials and Test Methods." These latter sections make for interesting reading if one maintains an awareness of the problems and hopes of restorative dentistry. They are, however, much too detailed for the casual reader to absorb. One is awed by methods and findings which are only partially comprehended.

It is in all a book for the scientist, for whom it has much meaning. It would be a rare clinician who could grasp the detail of its content.

G. A. Brass

AN INTRODUCTION TO PERIODONTIA

H. M. Goldman, S. Schluger, D. W. Cohen, B. S. Chaikin and L. Fox. Ed. 2. St. Louis, Mosby, 1962. 367 p. Illus. \$8.00

Like its predecessor, this second edition of the postgraduate lecture series is a very convenient and helpful book for the practising dentist. For the undergraduate student, however, it would be inadequate as a text book, though it might still be of value for reference purposes.

Differences of opinion between the five contributors which were evident in the first edition have been eliminated in this new edition. The chapter on treatment planning and prognosis suggests that considerable thought has been given to this difficult subject.

Due to the small size of the book the main criticisms are directed to the chapters on occlusal adjustment, orthodontic movement and acute lesions. Much general information has been given in these areas but too few specific procedures are described. However, there is one sound piece of advice in the chapter on occlusal adjustment by selective grinding: "where there is no evidence of disease associated with traumatic occlusions, then the occlusion should be left alone."

Regardless of these criticisms, this is nevertheless a book which should be of considerable value to the dental practitioner. The section on surgical procedures is particularly well covered.

R. F. Harvey

DENTAL-MEDICAL EMERGENCIES AND COMPLICATIONS

I. J. Berlove. Ed. 2. Chicago, Year Book Medical Publishers, Inc., 1963. 491 p. \$8.50

As stated in the preface, this book was conceived "to help the general practitioner

and the various specialities in dentistry, as well as the physician, so that they will be able to handle more quickly and efficiently the dental-medical emergencies and complications arising in the office of the dentist, and, in some instances, in the hospital."

Thirty chapters are divided into five sections including general considerations of emergency management, anaesthesia, emergency complications of surgery, haemorrhage, and medical complications of dental practice.

The author, by virtue of his combined training in oral surgery and otorhinolaryngology, has subdivided these broad headings to include all common and most unusual emergencies and complications encountered in the treatment of disease of the oral cavity and contiguous structures. Specific techniques of instrumentation during exodontic complications have been purposefully omitted. However, the multitude of problems, considered with their treatment, are outlined in great detail.

The second edition has been considerably updated and includes new chapters on such topics as anaesthesia in the geriatric patient, new trends in oral surgery, anticoagulant therapy in oral surgery, allergic reactions, paraesthesia, cardiovascular disease, and a table of drug dosages for children.

The concise manner in which this often neglected aspect of practice is presented makes this volume a valuable asset to the office library of all dental practitioners.

R. K. Lindsay

INLAYS, CROWNS AND BRIDGES: AN ATLAS OF CLINICAL PROCEDURES

C. J. Miller. Philadelphia and London, W. B. Saunders Co., 1962. (Available from McAinsh & Co. Ltd., Toronto and Vancouver) 268 p. Illus. \$19.45

The dental profession has found a need for books of this type in order that specific procedures can be followed with a minimum of words and a maximum of clearly reproduced illustrations.

This atlas of clinical procedures in restorative dentistry does this very well on the subjects presented. As the author states, "the material contained therein has been clinically proved during years of practice."

The total concept of restorative dentistry is kept in perspective and the patient considered as a physiological unit. The full-mouth radiographic surveys of treated patients are open to question, when one views the marginal adaptation of some of the completed restorations.

The changes that have evolved in the preparation of hard tooth structure for cast restorations, as well as specific techniques for introducing the more recent elastic impression materials into these more conservative types of preparations are not described.

However, no single text can cover all these details.

The important thing is that the author presents methods by which one can produce in the dental office and in the laboratory the kind of dental restorations that patients are entitled to in this day and age. He does this in a very clear fashion.

The general practitioner who finds that he lacks an organized approach to the more extensive restorative problems, will probably gain valuable assistance from this publication.

E. R. Ambrose

YEAR BOOK OF DENTISTRY 1962-63

S. D. Tylman, D. A. Keys, J. W. Knutson, R. E. Moyers, H. B. G. Robinson and C. W. Waldron. Chicago, Year Book Medical Publishers, 1963. 479 p. Illus. \$7.50

The six editors of the *Year Book of Dentistry* are professors and heads of departments in various dental faculties in the United States. R. E. Moyers, former head of the Department of Orthodontics, Faculty of Dentistry, University of Toronto, replaces H. J. Noyes as editor of the orthodontic section in this current issue of the *Year Book*.

There are sixteen other *Year Books* in various fields of medicine in addition to the one in dentistry. Annual volumes have been continuously published since 1900. The *Year Books* contain abstracts selected by the editors from the most significant reports which have appeared during the preceding year in the world's most scientific journals.

The current volume devotes a total of 76 pages to the orthodontic section, making this the most extensive coverage of any division in this year's publication. The other subjects covered are diagnosis, endodontics, caries and hard tissue lesions, public health, temporomandibular function, surgery, anaesthesia, restorative and prosthetic dentistry.

The careful condensation of the articles, the abundance of illustrations, and the incisive comments of the editors make this book an excellent adjunct to attendance at clinics and lectures for the practitioner who wishes to keep abreast of the many current advances in dentistry in North America and in foreign countries.

R. E. Feasby

additions to the library

- AMERICAN DENTAL ASSOCIATION, COUNCIL ON DENTAL THERAPEUTICS. Accepted dental remedies. Chicago, American Dental Association, 1963. 212 p. \$3.00
- AMERICAN SOCIETY OF ORAL SURGEONS. Conference on oral cancer, October 11, 1960, Phoenix, Arizona. Chicago, 1962. 47 p. illus.
- BERLOVE, I.J. Dental-medical emergencies and complications. 2nd ed. Chicago, Year Book Medical Publishers, Inc., 1963. 491 p. \$9.35
- BURCHER, E.O. and SOGNAES, R.F. Fundamentals of keratinization; a symposium presented at the New York meeting of the American Association for the Advancement of Science, December 30, 1960. Washington, A.A.S., Pub. No. 70, 1962. 189 p. illus. \$7.05
- CAMPBELL, J.M. Dentistry then and now. Glasgow, Pickering and Inglis Ltd., 1963. 328 p.
- CHATWIN, Maj. J.V.P. Disturbances of the temporomandibular joint. Reprint from the Medical Services Journal, Veterans Affairs Bldg., Ottawa, Canada. Vol. XVIII, No. 7, 1962.
- MADDEN, C.K. Practical procedures with the twin wire appliance. Brooklyn, Bruder, 1950. (3rd print. 1962.) 63 p. illus. \$7.50
- MICHIGAN UNIVERSITY, SCHOOL OF PUBLIC HEALTH. Workshop on hospital safety and sanitation with special reference to patient safety. Ann Arbor, Continued Education Service, 1962. 208 p. illus. \$3.00
- PATTEN, B.M. Foundations of embryology. Toronto, McGraw-Hill Co., Inc., 1958. 578 p. illus. \$10.55
- PHILLIPS, R.W. and RYGE, G. Adhesive restorative dental materials. Proceedings from a workshop held at Indiana University Medical Center, Indianapolis, Sept. 28 and 29, 1961. 216 p. illus.
- SPRAU, R.L. and GERNERT, E.B. History of Kentucky dentistry, 1636-1960. Louisville. Kentucky Dental Association, 1960. 168 p. illus. \$2.00
- STORTEBECKER, T.P. Dental infectious foci and diseases of the nervous system. (Acta Psychiatrica et Neurologia Scandinavica, Suppl. 157, Vol. 36, 1961.) 62 p. illus. \$3.25

in memoriam

- GASPARD FAUTEUX — Le Dr G. Fauteux de Montréal, ancien lieutenant-gouverneur de la province de Québec, âgé de 64 ans, est décédé le 20 mars 1963. Il était né à St-Hyacinthe, P. Qué. en 1898. Il obtint son diplôme en chirurgie dentaire à l'Université de Montréal en 1921. Nommé député au parlement fédéral en 1942, il était le Président de la Chambre des Communes depuis 1945 jusqu'à 1949. Ensuite il est devenu membre du Conseil Privé (Privy Council). Le Dr Fauteux était lieutenant-

gouverneur de la province de Québec entre 1950 et 1958. Aussi fût-il membre honoraire du Collège des chirurgiens dentistes de la province de Québec. Lui survivent sa femme, Marguerite; ses trois fils, Roger, Paul et Gaspard, Jr.; une fille, Mme. Claude Castonguay; deux frères, le Dr. Aimé Fauteux de la Commission du Service civil de la province de Québec, et M. Le Maître Gérard Fauteux de la Cour suprême du Canada; une soeur, Mme. Honoré Mercier; ainsi que huit petits-enfants.



Gaspard Fauteux

Dr. G. Fauteux of Montreal, former Lieutenant-Governor of the Province of Quebec, died on March 20, 1963. He was 64. Born in St. Hyacinthe, P. Quebec, in 1898, Dr. Fauteux graduated from the University of Montreal in 1921. He was elected to the House of Commons in 1942 and was Speaker of the House of Commons from 1945 until 1949 when he was created a member of the Privy Council. Dr. Fauteux served as lieutenant-governor of the Province of Quebec from 1950 to 1958. In 1947 Dr. Fauteux was made an honorary member of the College of Dental Surgeons of the Province of Quebec. Besides his wife, Marguerite, he is survived by three sons, Roger, Paul and Gaspard, Jr.; one daughter, Mrs. Claude Castonguay; two brothers, Dr. Aimé Fauteux, Civil Service Commissioner of the Province of Quebec, and Mr. Justice Gérard Fauteux of the Supreme Court of Canada; a sister, Mrs. Honoré Mercier; and eight grandchildren.

RUSSELL HAVELOCK CHANT — Dr. R. H. Chant of Foam Lake, Saskatchewan died on March 19, 1963. He was 74. Dr. Chant was born in Blackwater, Ontario in 1888. He attended the Royal College of Dental Surgeons of Ontario and graduated from the Chicago College of Dental Surgery (Loyola University) in 1911. He practised for some time in Regina before moving to Foam

Lake. Dr. Chant is survived by his wife, Vilda, three children, seven grandchildren and one great-grandchild.

JAMES DURRAN — Dr. J. Durrán of Galt, Ontario died on March 6, 1963. He was 78. Dr. Durrán was born in Scotland in 1885. He received his early education in Campbellford, Ontario and graduated from the Royal College of Dental Surgeons of Ontario in 1910. Dr. Durrán practised in Galt. He became a life member of the Royal College of Dental Surgeons in 1960.

FRANCIS WINSTON DYER — Dr. F. W. Dyer of Vancouver, British Columbia died on March 31, 1963. He was 52. He was born in Indian Head, Saskatchewan in 1911 and graduated from the University of Southern California in 1936. At the time of his death Dr. Dyer was on the staff of Shaughnessy Military Hospital in Vancouver. Throughout World War II he served with the Royal Canadian Dental Corps. Dr. Dyer is survived by his wife and one daughter.

FRANK GARFIELD HENDRY — Dr. F. G. Hendry of Delhi, Ontario died on February 28, 1963. He was 81. Dr. Hendry was born in Woodstock, Ontario in 1881. Upon graduation from the Royal College of Dental Surgeons of Ontario in 1903, he moved to Delhi where he practised for over fifty years. Dr. Hendry is survived by two sisters-in-law, Mrs. Irene Hendry of Toronto and Mrs. J. R. Lockhart of Bristol, New Brunswick; two nieces, Mrs. Joan Thompson and Mrs. Adrienne Shearer, both of Toronto; and one first cousin, Mrs. Marion Taylor of Port Dover, Ontario.

HOWARD B. JAMES — Dr. H. B. James of Oshawa, Ontario died on March 24, 1963. He was 70. Dr. James was born in Oshawa in 1892. He practised in Oshawa and was chairman of the Local Board of Health there in 1937. Dr. James is survived by his wife, Una M., and a sister, Mrs. Edna Caldwell.

ROBERT LAURENCE LYNN — Dr. R. L. Lynn died recently in Vermilion, Alberta. He was 48. Dr. Lynn was born in Cardston, Alberta in 1914 and graduated from Northwestern University in 1938.

JOHN DANIEL MacMILLAN — Dr. J. D. MacMillan of Newcastle, New Brunswick died on February 12, 1963. He was 83. Dr.

MacMillan was born in New Mills, New Brunswick in 1879. He received his dental degree from the University of Maryland in 1904. After practising in Fredericton, New Brunswick from 1904 to 1906 he went to Newcastle where he practised for more than fifty years. He was an honorary member of the New Brunswick Dental Society. Surviving Dr. MacMillan are two sons, Dr. J. A. I. MacMillan and Donald MacMillan, both of Newcastle; two daughters, Mrs. Leslie King of Oromocto and Mrs. Willis Brown of Montreal; one sister, Mrs. James Creighton of New Mills; and several grandchildren.

JOHN CLARK MALCOLMSON — Dr. J. C. Malcolmson of Toronto, Ontario died on March 19, 1963. He was 63. Dr. Malcolmson was born in Toronto in 1900. After graduating from the Royal College of Dental Surgeons of Ontario in 1924, he practised in Florida from 1925 until 1930 when he returned to Toronto where he practised until his death. He served overseas during the First World War and was a prisoner in Germany for ten months. Dr. Malcolmson is survived by his wife, Florence Elizabeth; one daughter, Lynda Jane; one son, John Herbert; one sister, Mrs. Gordon Fleming; and a brother, Douglas.

LESLIE H. McINTYRE — Dr. L. H. McIntyre died recently in Edmonton, Alberta. He graduated from Northwestern University in 1911.

JOHN FRANKLIN O'FLYNN — Dr. J. F. O'Flynn of St. Catharines, Ontario died on April 3, 1963. He was 84. Born in Shelburne in 1878, Dr. O'Flynn received his early education at Owen Sound Collegiate and graduated from the Royal College of Dental Surgeons of Ontario in 1899. Thereafter he practised in St. Catharines. He was an honorary life member of the Royal College of Dental Surgeons of Ontario. Dr. O'Flynn is survived by two sons, John H. of St. Catharines and Franklin M. of Hamilton; one brother, Thomas J. O'Flynn; and a sister, Edith M. O'Flynn.

HARVEY JOHN DONALDSON ROBINSON — Dr. H. J. D. Robinson of Calgary, Alberta died on February 9, 1963. He was 74. Born in Leamington, Ontario in 1888, Dr. Robinson graduated from the Royal College of Dental Surgeons in 1915. He practised in Detroit, Michigan and several centres in western Canada, the last of which was Calgary. He served with the Royal Canadian Dental Corps in the Second World War.

Dr. Robinson is survived by his wife and one daughter.

LISTER EMSLIE SMITH — Dr. L. E. Smith died recently in Edmonton, Alberta. He was 65. Dr. Smith was born in Medicine Hat, Alberta in 1898. He graduated from the University of Alberta in 1927.

EDWIN ARTHUR STOREY — Dr. E. A. Storey of Sarnia, Ontario died on April 6, 1963. He was 64. Dr. Storey was born in Sarnia in 1898 and graduated from the Royal College of Dental Surgeons of Ontario in 1924. He was a past president of the Lambton County Dental Society and a member of the Board of Governors of the Ontario Dental Association. Dr. Storey was on the dental staff of St. Joseph's Hospital, Sarnia. Besides his wife, Kathleen Harriet Robinson, Dr. Storey is survived by two sons, Dr. Trevor Storey of Sarnia and Dr. Arthur Storey of Ann Arbor.

CHARLES WILLIAM SUTHERLAND — Dr. C. W. Sutherland of Vancouver, British Columbia died on October 30, 1962. He was 78. Dr. Sutherland was born in Pictou, Nova Scotia in 1884 and graduated from Philadelphia Dental College (Temple University) in 1907.

JOSEPH TEICH — Dr. J. Teich of Almonte, Ontario died on March 14, 1963. He was 71. Dr. Teich was born in New York City in 1891. He received his early education in Toronto at Jarvis Collegiate Institute and graduated from the Royal College of Dental Surgeons of Ontario in 1920. He was president of the Temiskaming Dental Society from 1930 to 1931.

ARTHUR BLAKE WAGG — Dr. A. B. Wagg of Toronto, Ontario died on April 20, 1963. He was 76. Dr. Wagg was born in Uxbridge, Ontario in 1886 and graduated from the Royal College of Dental Surgeons of Ontario in 1911. He was formerly connected with the Children's Clinic at the Toronto General Hospital. He is survived by one son, Dr. Donald A. Wagg, and two sisters, Mrs. Florence Weatherill and Mrs. Mabel Brown.

GEORGE CYRIL WATSON — Dr. G. C. Watson of Aldergrove, British Columbia died on February 19, 1963. He was 70. Dr. Watson was born in County Armagh, Ireland in 1892. He graduated from the North Pacific College (University of Oregon) in 1916. Before his death Dr. Watson had practised in Aldergrove for the past ten years.

announcements

CONVENTIONS OF THE CANADIAN DENTAL ASSOCIATION

1964	Edmonton, Alberta	June 28-July 1
1965	Quebec City, P.Que.	May 30-June 2

FUTURE EVENTS

<i>Date</i>	<i>Function</i>	<i>Location</i>	<i>Officer</i>	<i>Address</i>
June 30-July 3, 1963	Atlantic Provinces Dental Convention	Fredericton, New Brunswick	Dr. K. A. Hetherington	98 York St., Fredericton, N.B.
July 1-7, 1963	Fédération Dentaire Internationale	Stockholm, Sweden	Dr. T. Telander	Nybrogatan 53, Stockholm C, Sweden
July 7-12, 1963	Int'l Conference on Functional Jaw Orthopaedics	Buenos Aires, Argentina	Dr. R. S. Bado	Círculo Argentino de Odontología, Directorio 1824, Buenos Aires, Argentina
July 22-26, 1963	British Dental Association	Oxford, England	Dr. J. N. Peacock	13 Hill Street, London W.1, England
Sept. 16-18, 1963	Eastern Ontario Dental Association	Seigniory Club, Montebello, P.Q.	Dr. A. C. Murchison	566 Byron Ave., Ottawa 13, Ont.
Sept. 22-25, 1963	XIVth Dental Meeting Asociación Odontológica Argentina	Buenos Aires, Argentina	Dr. A. F. Alvarez	Junin 959, Buenos Aires, Argentina
Oct. 14-17, 1963	American Dental Association	Atlantic City, New Jersey	Dr. H. Hillenbrand	222 East Superior Street, Chicago 11, Illinois
Oct. 17-20, 1963	Austrian "Dentisten" Congress	City Hall, Vienna		11 Kohlmarkt, Vienna 1, Austria
Oct. 20-24, 1963	35th Italian Stomatological Congress	Rome, Italy	Dr. P. Lalli	Via Savoia No. 78, Rome, Italy
Nov. 17-22, 1963	VIIth Mexican Dental Congress	Mexico City, Mexico	Dr. R. Sanchez Woodworth	Sinaloa No. 9, México 7, D.F., Mexico
25 nov.-1 déc., 1963	XXXVIIes Journées Dentaires Internationales de Paris	Maison de la Chimie, Paris	M. Henri Huguet	33 ave Pierre Ier de Serbie, Paris 16e, France
Nov. 28, 1963	Annual Winter Clinic, Academy of Dentistry	Royal York Hotel, Toronto	Mrs. N. H. Montgomery	230 St. George Street, Toronto, Ont.

Note • Due to lack of space the Journal cannot accommodate all announcements of foreign dental meetings and postgraduate and refresher courses. Readers are invited to write to C.D.A. headquarters for information concerning unlisted meetings and courses. Further information concerning listed meetings and courses should be sought from the sponsoring institution.

L'Association Dentaire Canadienne

Volume 29

Numéro 6

juin 1963

JOURNAL

The Canadian Dental Association

La stérilisation dans un cabinet dentaire

par Claude Madore, D.D.S., Montréal, P.Qué.*

Pasteur, il y a plus d'un siècle, a inauguré l'ère de la stérilisation; ses découvertes ont fait avancer la science à pas de géant, puisqu'on ignorait avant cette époque l'origine bactérienne de l'infection.

Les chirurgiens accomplissaient des merveilles dans leur acte opératoire, mais un grand nombre de leurs malades mouraient d'infection post-opératoire.

Pasteur déclarait: "Toute chose utilisée au cours d'un travail chirurgical doit être

stérile" ou encore: "Un article est stérile ou il ne l'est pas; et s'il n'est pas stérile entièrement, il est dangereux."

Cette conception actuellement acceptée comme standard en stérilisation fut en réalité le principe de la stérilisation et de l'aseptie modernes. Les connaissances actuelles au sujet des microorganismes, l'évolution des techniques de laboratoire et les progrès réalisés dans le domaine chirurgical ont révolutionné les méthodes des interventions du dentiste.

L'époque de Pasteur et de Lister est révolue, car d'autres chercheurs ont poussé

Conférence prononcée à la Société dentaire de Montréal, le 19 mars 1963.

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plus loin leurs travaux et ont fait avancer la science de la stérilisation.

Le dentiste contemporain accorde à la microbiologie la place qu'elle doit occuper dans toute thérapeutique rationnelle. Le dentiste et le médecin doivent, à l'occasion, se demander s'ils prennent toutes les mesures qui découlent de ces grands principes; ils doivent se rendre compte s'ils pratiquent réellement une stérilisation complète ou s'ils se fient à une stérilisation quelconque, en laissant aux systèmes de défense de l'organisme le soin de combattre l'effet des bactéries.

EXISTE-T-IL DES STANDARDS EN STÉRILISATION?

Il y a des règles définies et acceptées en stérilisation. Ces principes doivent être appliqués à la lettre, en toutes circonstances. Une stérilisation efficace détermine les circonstances, mais ce ne sont pas les circonstances qui déterminent la stérilisation.

Les méthodes d'aseptie efficaces et standardisées doivent être mises en œuvre pour toute intervention effectuée sur tout patient.

QU'EST-CE QUE LA STÉRILISATION?

La stérilisation est la destruction des bactéries. Ces bactéries peuvent se classer sommairement en: (1) bactéries avec spores, et (2) bactéries sans spore.

La sporulation des microorganismes joue de nos jours un grand rôle dans la mise au point des appareils de stérilisation ou des solutions germicides. Les bactéries peuvent aussi se diviser en: (1) pathogènes, et (2) non pathogènes.

Spores

Les microbes pathogènes à spores se trouvent dans la saleté et dans la terre; ils

sont rarement dans la poussière de l'air. Les spores sont entourées d'une coquille, qui les protège contre la chaleur.

Elles sont parfois oubliées; on les néglige dans les traitements qui ne requièrent pas d'intervention chirurgicale. Elles constituent quand même une menace constante.

Les bactériologistes ont insisté pour déclarer que l'eau bouillante ne détruit pas les spores, même au cours d'une exposition prolongée. La sûreté de la technique basée sur l'eau bouillante se détermine seulement par la perfection avec laquelle les organismes sporulés ont été éliminés par des moyens mécaniques.

Jordan et Burrows¹ parlent des spores en ces termes: "Quelques bacilles ont la faculté de se former une structure résistante qu'on appelle spore. Ces spores résistent très bien aux germicides chimiques et à une température élevée. Au point de vue physiologique, la spore est ordinairement considérée comme un stage de repos; elle sert alors à sauver l'espèce à une période non propice à son développement. A ce point de vue, ce phénomène est analogue aux périodes d'hibernation de nos insectes et de nos animaux. La formation de la spore n'est pas un phénomène de multiplication, c'est tout simplement un phénomène de préservation.

Virus

Les virus sont des nouveaux venus dans la famille microbienne. Les plus connus sont le virus de l'influenza, de la polyomyélite, de la variole, du rhume ou de la grippe, des oreillons, de l'herpès et de l'hépatite.

HÉPATITE INFECTIEUSE

Les médecins et les dentistes portent un intérêt tout spécial à l'hépatite infectieuse, car ils y voient une influence amenée par les injections en général. Toute injection, sous-cutanée, intra-musculaire ou intra-veineuse données dans la bouche ou dans

toute autre partie du corps, exposent le patient à une hépatite. Le virus en cause est inconnu, car, étant filtrant, il échappe encore à toute tentative d'isolation.

Un grand nombre de personnes sont porteuses de virus, sans en souffrir; c'est pourquoi la transmission de cette maladie est difficile à contrôler. Il vaudrait mieux que ces porteurs ambulants montrent quelques signes; il serait alors facile de les dépister et d'utiliser à leur égard des procédures particulières.

Le dentiste qui donne une injection à un de ces porteurs de virus s'expose à transmettre ces hôtes indésirables à d'autres personnes qui ne les toléreront pas aussi bien.

Comment éviter ce risque? La stérilisation à froid détruit les bactéries, mais elle n'élimine pas les virus en général. On a suggéré, dans certains milieux, d'utiliser une solution d'oxy-éthylène pour obtenir de bons résultats. Par ailleurs, des chercheurs ont émis l'opinion que: "Il n'y a aucune preuve évidente que l'oxy-éthylène ou d'autres produits chimiques détruisent le virus responsable de l'hépatite infectieuse. L'exposition à la chaleur est actuellement la seule procédure efficace."²

Quelle doit donc être l'attitude du dentiste en face de ce problème?

1. ne jamais employer la même carpole de solution anesthésique chez un second patient
2. stériliser les aiguilles et les seringues dans un autoclave
3. utiliser l'aiguille individuelle pour une sécurité absolue.

Le rôle du dentiste dans la transmission de l'injection est considérable: aussi doit-il mettre tout en œuvre pour qu'il se crée une "conscience de la stérilisation."

LA DÉSINFECTION EN GÉNÉRAL DANS UN CABINET DENTAIRE

La première préoccupation du dentiste, en matière de stérilisation, doit être de ne pas transmettre à un patient les bactéries d'un autre patient. Il faut que tous les ac-

cessoires du cabinet soient propres, car la propreté est le premier pas de la stérilisation. On peut juger du soucis du dentiste pour l'aseptie par l'apparence propre et ordonné de son cabinet.

L'ASEPTIE DANS UNE SALLE D'OPÉRATION

On convient que la stérilisation de la cavité buccale n'est pas praticable. Les précautions prises par les chirurgiens et les infirmières ont pour but de protéger le patient d'une contamination venant de l'extérieur; celui-ci est immunisé contre ses propres bactéries.

On constate, sans pouvoir le prouver scientifiquement, que les patients opérés dans la cavité buccale, à l'hôpital, guérissent mieux que ceux sur lesquels le dentiste intervient dans son cabinet. D'autres facteurs, tels que le repos au lit, les soins hospitaliers et l'emploi routinier d'antibiotiques, contribuent aussi à la récupération plus rapide des plaies.

Il serait préférable que le dentiste exécute ses interventions chirurgicales dans un climat d'aseptie complète; mais cette technique, pour plusieurs raisons de commodité et d'économie, ne peut pas se pratiquer.³ Le praticien, cependant, doit surveiller une foule de détails qui favorisent l'aseptie: vêtements du personnel, installation du patient, abolition de la poussière, propreté des accessoires, crachoir, propreté impeccable des mains de l'opérateur qui ne doivent jamais toucher ce qui est contaminé. La protection du patient exige que la chaîne de contamination soit brisée entre lui et tous les patients précédents.

DÉSINFECTION ET STÉRILISATION

La désinfection et la stérilisation ont comme objectif la destruction des microorganismes capables d'infecter les tissus et de produire des maladies infectieuses.

Les mots désinfection et stérilisation sont souvent pris l'un pour l'autre, mais ils n'ont pas le même sens.

La désinfection implique la destruction des micro-organismes usuels producteurs de maladie; elle n'inclut pas des micro-organismes tels que spores, bacilles de la tuberculose et certains virus résistants.

La stérilisation détruit tout indice de vie. La méthode la plus pratique, la moins coûteuse et la plus effective de l'obtenir repose sur la chaleur; elle assure la destruction complète de tous les micro-organismes. Certains agents bactéricides chimiques obtiennent des résultats semblables. La chaleur stérilise, mais à certaines conditions. Il faut une chaleur humide, sous une pression de 250° Far., durant quinze minutes, ou une chaleur sèche à 350° Far., durant 60 minutes.

STÉRILISATION DANS LE CABINET DENTAIRE

Les instruments du dentiste doivent être parfaitement stériles. Comment peut-il obtenir cette stérilisation parfaite? Par divers procédés, dont voici les principaux: (1) la stérilisation par des agents chimiques; (2) la stérilisation à l'eau bouillante; (3) la stérilisation à la vapeur, sous pression; (4) la stérilisation à la flamme.

La stérilisation par des moyens chimiques

Depuis l'époque de Pasteur, c'est-à-dire depuis la découverte de l'origine microbienne des infections, la littérature a été envahie par un flot de composés chimiques

recommandés pour leurs propriétés antiseptiques, désinfectantes ou germicides.

L'antiseptique idéal serait celui qui pourrait être assez puissant pour détruire toutes les bactéries pathogènes à la surface ou à l'intérieur du corps, sans endommager les tissus.⁴

Jusqu'à maintenant, l'antiseptique parfait n'a pas encore été découvert, mais un agent synthétique, découvert par un docteur Domagk, est digne de mention. Ce produit, connu sous le nom chimique suivant "Cationic quaternary ammonium chloride" posséderait des propriétés germicides excellentes.

Dès son apparition, plusieurs laboratoires ont étudié en clinique ses propriétés caractéristiques. Le benzalkonium chloride (Chlorure de Zéphiran) a été le premier agent antiseptique popularisé en Amérique. Il a été suivi par une multitude d'autres, tels le *Phemorol Chloride* (chlorure de benzethonium), le *Ceepryn Chloride* (chlorure ethyl pyridium) et, plus récemment le *Cetyl chloride* Chloride et le *Quamonium*.

A cause de la grande demande de plusieurs industries et de l'intérêt des professions médicale et pharmaceutique, des centaines de produits synthétiques différents ont surgi de cet agent chimique.

Voici les deux plus récents germicides: le *Cetyl chloride* (chlorure cetyl dimethyl ethyl d'ammonium) et le *Quamonium*.

Le *Quamonium* diffère du premier en ce qu'il contient de l'alcool isopropylique et un inhibiteur de la rouille. Il agit aussi

TABLEAU 1 Activité germicide des solutions chimiques usuelles.

Solution	Résultats après		
	5 min.	15 min.	60 min.
Cetyl chloride	0	0	0
Zéphiran Chloride	+	0	0
Bard Parker Germicide	0	0	0
Formaldehyde et alcool éthylique	0	0	0
Alcool isopropylique, 70 pour cent	+	+	0
Lysol, 2 pour cent	+	+	+
Sérum physiologique comme contrôle	+	+	+

bien sur les bactéries gram-positives que sur les gram-négatives. Il a l'avantage d'être bien toléré par les tissus. Il peut servir à nettoyer la peau dans la routine des préparations pré-opératoires.

Les agents dits ammonium quaternaire sont très effectifs contre les microorganismes avec spores.

La stérilisation des instruments tranchants contaminés par le sang séché et par les bactéries, principalement quand il s'agit de microorganismes anérobies porteurs de spores, présente des difficultés.

L'activité germicide de ces composés quaternaires semble supérieure à celle des deux agents connus dont la composition est à base de mercure. Il s'agit ici du *Bard Parker Germicide* et de l'agent à base de formaldéhyde et d'alcool éthylique.

Les expériences ont prouvé aussi que l'alcool à 70 pour cent et le Lysol n'avaient aucune valeur réelle pour la stérilisation.

Les produits commerciaux dont la formule est celle décrite plus haut sont les suivants: *Zéphiran Chloride*, *Phermerol Chloride*, *Ceepryn Chloride*, *Cetylclide Chloride* et *Quamonium*, *Germisol*, *Benzall*.

Ces agents remplissent leur fonction stérilisatrice selon des conditions très précises: (1) les solutions doivent être renouvelées à des périodes régulières. Les fabricants conseillent de changer complètement les solutions une fois par semaine. Si elles sont sales, il faut les renouveler plus souvent, spécialement si elle a pris contact avec du sang ou du pus; (2) il faut laver soigneusement les instruments à l'eau et au savon avec une brosse, avant de les plonger dans le germicide; (3) les aiguilles à anesthésie ne peuvent pas être stérilisées avec ces agents chimiques, car le liquide antiseptique, par le phénomène de capillarité, ne pénètre pas à l'intérieur de l'aiguille. La même règle s'applique même si on n'injecte pas complètement le contenu de la seringue pour nettoyer l'aiguille avec les dernières gouttes de la solution anesthésique et même si on nettoie l'intérieur de l'aiguille en laissant s'écouler la solution anesthé-

sique avant de l'injecter; (4) il faut laisser à la solution antiseptique le temps d'exécuter son travail. On recommande de laisser tremper les instruments au moins une demi-heure et ne pas y ajouter entre-temps d'autres instruments. Il est donc bon d'utiliser plusieurs récipients si on a à stériliser des instruments à différents intervalles. Il est alors plus facile de calculer exactement le temps de stérilisation.

Les instruments doivent aussi être complètement immergés dans la solution. Il faut donc que la solution recouvre entièrement les instruments. Quels instruments peuvent être stérilisés dans un germicide? En principe, aucun. Car il n'est pas certain que ces solutions chimiques soient capables de tuer un virus ou une spore.

Les instruments qui viennent en contact avec les couches sous-jacentes des tissus, dans une plaie, doivent être strictement stériles. Les autres n'exigent pas une stérilisation aussi stricte. On peut donc — surtout en présence de la digue—utiliser les solutions antiseptiques pour les instruments de dentisterie opératoire, curette, ciseaux, fraises, clamps, foulloirs, matrices, miroirs, explorateurs, etc.

De même, les instruments et les matériaux servant en prothèse: porte-empreintes, cire, plaques-bases, en un mot, tout ce qui est introduit dans la bouche du patient.

Le dentiste a le devoir de s'assurer que tout ce qui vient en contact avec les tissus de son patient soit propre. Il y aura alors certainement diminution des cas d'herpès.

Par ailleurs, tous les instruments de chirurgie, d'endodontie et de périodontie—gros ou petits—qui interviennent sous la muqueuse, doivent être rigoureusement stériles et les agents chimiques ne peuvent pas garantir cette stérilité impeccable.

On peut donc conclure que les solutions germicides ont peu de valeur dans un cabinet dentaire. Elles peuvent s'utiliser pour désinfecter des objets mis dans la bouche des patients et pour l'entreposage des aiguilles, des lames de bistouris, des fraises, après leur stérilisation à l'autoclave. Les solutions antiseptiques proté-



FIGURE 1 Stérilisateur ordinaire à l'eau bouillante.



FIGURE 2 Stérilisateur à la vapeur d'eau sous pression (autoclave).



FIGURE 3 Cadran de stérilisateur autoclave.

gent ces instruments contre la poussière et contre une contamination possible.

La stérilisation par des moyens physiques

Ces moyens sont les suivants: (1) l'eau bouillante; (2) l'air chaud; (3) la vapeur d'eau sous pression; (4) la vapeur d'alcool sous pression.

1. L'eau bouillante.—La stérilisation à l'eau bouillante est la méthode la plus simple et la plus ancienne: elle n'exige qu'un récipient, de l'eau et du feu. C'est un procédé d'urgence, où l'eau doit bouillir à 212° F., durant 10 minutes.

Cette façon de stériliser les instruments qui était en usage dans la totalité des cabinets des dentistes, il y a vingt-cinq ans, est considérée désuète, de nos jours, car elle a des limites assez restreintes. De l'avis des manufacturiers de stérilisateur à l'eau bouillante, elle ne peut que stériliser des instruments en acier inoxydable, car elle favorise la corrosion et la rouille des métaux. Cette stérilisation ne détruit pas les spores; donc les instruments stérilisés de cette façon ne doivent pas être mis en contact avec le sang. De plus, ce stérilisateur n'est d'aucune utilité pour le coton ou les tissus. L'usage d'un stérilisateur à l'eau n'est pas aussi simple qu'on peut le croire. Sa température doit être constante. Aussi faut-il que le contrôle automatique de la chaleur fonctionne adéquatement. Quand le stérilisateur est fixé au degré "bas," il ne stérilise pas. Il ne sert qu'à maintenir l'eau à un degré convenable de température afin d'épargner du temps au moment d'une nouvelle stérilisation, en conservant l'eau assez chaude.

Ce stérilisateur eut ses jours de gloire au moment où les autoclaves étaient des instruments trop encombrants et trop difficiles à manipuler.

2. La chaleur sèche.—La stérilisation à la chaleur sèche utilise un procédé très simple. L'appareil est des plus rudimen-



FIGURE 4 Stérilisateur à vapeur d'alcool sous pression (Vapostéril).

taires. En effet, tout four qui peut atteindre une température plus élevée que 350° F. est susceptible d'être employé dans ce but. Il faut maintenir cette température durant une heure pour obtenir une stérilisation parfaite.

La chaleur sèche donne une stérilisation sûre en détruisant les bactéries à spores et en protégeant les instruments contre la corrosion et la rouille. Elle s'emploie pour les instruments chirurgicaux, les aiguilles, les seringues, les bistouris, le verre, les instruments tranchants, de dentisterie opératoire, d'endodontie, les fraises, les miroirs, les daviers, etc. Ce genre de stérilisation a aussi l'avantage de pouvoir laisser, sans danger, dans l'appareil, les instruments jusqu'à leur usage. Ses avantages: (1) elle détruit tous les microorganismes; (2) elle ne favorise pas la corrosion, ni la rouille; (3) elle s'applique à tous les instruments; (4) elle se manipule facilement; (5) son appareil n'est pas coûteux et il n'exige pas d'entretien.

TABLEAU 2 La stérilisation des instruments.

Méthode	Temp. °F.	Temps min.	Humidité Pression	Détruit	
				Bactéries spores	Bactéries seules
Eau chaude	212	10	oui	non	oui
Vapeur sous pression	250-260	6-30	oui	oui	oui
Air chaud	350	60	non	oui	oui
Huile chaude	250	6-15	non	non	oui
Huile chaude	300	30-60	non	oui	oui
Vapeur alcool sous pression	250	15-30	oui	oui	oui

Ses inconvénients: (1) elle a peu de pénétration; (2) elle endommage le coton et les tissus; (3) elle altère le tranchant des instruments; (4) elle agit lentement (60 minutes).

Cependant quelques nouveaux appareils dont la température atteint 400° F. permettent de diminuer le temps nécessaire (20 minutes), avec la certitude que les virus de l'hépatite ont été détruits.

3. *La vapeur d'eau sous pression.*—Cette méthode de stérilisation s'effectue à l'aide d'un appareil appelé autoclave. L'autoclave est un appareil un peu plus compliqué que les deux autres; il fonctionne par la chaleur en présence d'humidité.

La chaleur sans humidité peut stériliser, mais l'addition d'humidité permet de réduire la température et le temps nécessaires. L'humidité fournit à la chaleur un véhicule qui lui confère un plus grand pouvoir de pénétration.

Par exemple, on peut stériliser un objet de coton à la vapeur sous pression à 250° F., en 30 minutes. Ce même objet exposé à la chaleur sèche exigerait une chaleur de 350° F., durant 60 minutes.

L'autoclave est le moyen par excellence pour la stérilisation du linge et du coton en général. On n'emploie l'air chaud sec que pour la stérilisation de verre de laboratoire.

La vapeur à 250° F. détruit toutes les variétés de spores rencontrées en pratique courante.

L'eau bout à 212° F. Aussi pour que la vapeur de 250° F. soit efficace, il faut retenir cette vapeur. Cette vapeur doit donc être enfermée. C'est là le principe de l'autoclave.

L'augmentation de la température de 212° à 250° F. contribue à détruire les spores. Les avantages de l'autoclave sont les suivants: (1) il est simple, s'il est moderne; (2) il épargne du temps; (3) il est sûr, car il détruit tous les microorganismes; (4) il est pratique, car il stérilise presque tous les instruments.

Ses désavantages sont qu'il rouille et corrode les instruments; de plus, il abîme le taillant des instruments tranchants.

4. *La vapeur d'alcool sous pression.*—L'autoclave avec une solution Vapo-Stéril est le dernier-né des stérilisateurs. Il s'appuie sur les trois grands principes: chaleur, pression, humidité. Il agit à la température de 250° F. et à une pression de 15 livres. Son humidité est créée par une solution spéciale: eau distillée, formaldéhyde, acétone, méthyl-éthyl-kétone, alcool éthylique, alcool butyl tertiaire, alcool isopropylique et un composé pour en masquer l'odeur.

Ses avantages sont de ne pas abîmer le taillant des instruments tranchants; l'absence d'eau prévient la rouille. Il stérilise toutes les catégories d'instruments et toutes sortes d'objets. Tout excepté le plastique. Même les contre-angles peuvent y être insérés sans danger.

STÉRILISATION DES SERINGUES ET DES AIGUILLES

Le dentiste peut utiliser des aiguilles ordinaires ou des aiguilles individuelles. S'il emploie les aiguilles individuelles, le problème de stérilisation ne se pose pas.

Il y a sur le marché des aiguilles individuelles montées sur seringues individuelles qui peuvent être employées pour toutes sortes d'injections.

Les aiguilles ordinaires soulèvent un problème de stérilisation. Les agents chimiques ne peuvent pas servir à la stérilisation des aiguilles, car ils ne peuvent pas pénétrer à l'intérieur de l'aiguille elle-même. De plus, les agents chimiques ne tuent pas les spores. L'eau bouillante non plus ne peut pas s'utiliser, car elle ne détruit pas les spores. Donc la seule façon de stériliser les aiguilles consiste à se servir de l'autoclave.

Une fois stérilisée à l'autoclave, l'aiguille doit être placée dans une jarre contenant une solution antiseptique dont la valeur est reconnue ou laissée dans un plateau qui aurait servi de réceptacle durant la stérilisation à l'autoclave.

On conseille d'insérer l'aiguille, à sa sortie de la jarre, dans un rouleau de coton stérile jusqu'à son utilisation. Cette précaution empêche le milieu extérieur, la poussière, par exemple, de venir en contact avec l'aiguille.

On a fait une expérience intéressante sur la contamination des aiguilles.⁵ Une série de 100 aiguilles a été examinée. Le but était d'étudier la possibilité d'une contamination bactériologique des aiguilles exposées à l'air d'une pièce. Cette série de 100 aiguilles a été divisée en deux groupes. Le groupe 1 comptait 50 aiguilles. Celles-ci furent exposées à l'air libre durant quinze minutes. Cinq de ces

aiguilles furent contaminées par des microorganismes saprophytiques.

Le groupe 2 comptait aussi 50 aiguilles. On les avait recouvertes d'un rouleau de coton hydrophile "propre" et exposées à l'air durant 15 minutes. Seulement deux furent contaminées.

Il faut noter que dans les deux cas, on n'a pas trouvé de bactéries pathogènes.

La seringue doit aussi être stérile, car elle vient en contact avec les lèvres, la langue, les dents, et les muqueuses du patient. Le strict minimum requis pour cette stérilisation serait un agent chimique, en employant des aiguilles individuelles. Si le dentiste emploie des aiguilles ordinaires, il devra utiliser l'autoclave pour stériliser le tout.

SUMMARY

Sterilization in the dental office is accomplished by means of germicidal solutions or by the application of heat as boiling water, dry hot air, water vapour under pressure (autoclaving), and alcohol vapour under pressure. The author discusses the inherent advantages and disadvantages of these various methods and concludes with recommendations for the sterilization of syringes and hypodermic needles.

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Nombre des dentistes au Canada • Le 1er janvier 1963 il y avait au Canada 5,999 dentistes enregistrés, dont 101 femmes. — Bureau des recherches économiques de l'A.D.C.

LA MALADIE DE CHRISTMAS (HÉMO-
PHILIE B) DANS LA THÉRAPEUTIQUE
DE LA PÉRIODONTOCLASIE

G. M. Kramer et A. F. Grissel. *O.Surg.,
O.Med. & O.Path.* 15:1056, 1962.

Il y a des maladies hémorragiques, comme le montrent de nombreux rapports, dont la gravité est telle que le dentiste hésite avant d'entreprendre des traitements chez ces malades. On ne trouve guère, dans la littérature dentaire, de renseignements au sujet des maladies hémorragiques moins graves.

Le dentiste qui s'intéresse au traitement des périodontoclasies se préoccupe davantage de ces dyscrasies sanguines, parce qu'elles peuvent jouer un rôle dans l'étiologie des affections du périodonte et parce qu'elles peuvent créer des problèmes au cours des traitements.

La vogue dont jouissent les techniques chirurgicales en périodontie, telles que les incisions vestibulaires, les curettages intra-osseux, l'ostéotomie et autres, exige que l'opérateur se renseigne davantage sur l'état constitutionnel de son patient. Ces techniques, contrairement aux gingivectomies simples, aux plasties ou aux curettages gingivaux, découvrent des surfaces importantes de tissus en profondeur. Des hémorragies, malgré des pansements chirurgicaux appliqués avec pression et qui renferment des ingrédients hémostatiques, peuvent se produire même chez des patients dont le temps de coagulation est normal. Il se peut que des traitements chirurgicaux d'importance s'entreprennent chez des patients qui, à l'insu de l'opérateur, souffrent de dyscrasies sanguines,

même à un degré infime; les suites opératoires sont parfois désastreuses.

Les ennuis, dans ces cas, se manifestent non seulement au cours de l'intervention, mais aussi après l'opération, même si la plaie a été recouverte de ciment approprié.

La maladie de Christmas ressemble à l'hémophilie, en ce sens qu'elle se transmet seulement aux mâles, par hérédité. Elle ne se différencie pas cliniquement de l'hémophilie; elle se caractérise par l'absence de la fraction de serum, la thromboplastine du plasma (PTC), qui influence la formation de la thromboplastine. Dans l'hémophilie classique, la protéine du serum, la globuline antihémophilique (AHG) est absente, tandis que, dans la maladie de Christmas, la fraction protéine du serum (PTC), telle que mentionnée, n'y est pas.

Dans les cas bénins de la maladie de Christmas, le temps de saignement, le temps de coagulation et le temps de la contraction du caillot, dans les tests ordinaires, peuvent être normaux. Le dentiste, face à une histoire de cas négative au point de vue hémorragique et à des ennuis hémorragiques post-opératoires, devrait exiger des tests plus spécifiques d'élimination de prothrombine ou de production de thromboplastine. Les laboratoires, d'habitude, ne font pas ces tests et il faut les demander.

Le dentiste, si on a porté un diagnostic de maladie du sang, doit tenir compte de ce facteur constitutionnel avant de décider en faveur de l'une ou l'autre méthode de traitement. Il est peu probable que des dentistes et leurs patients aient recours à des transfusions avant d'entreprendre des traitements de périodontie. Il faudra alors peut-être renoncer à un traitement

chirurgical qui se rend en profondeur dans les tissus périodontiques. Il sera peut-être impossible alors d'éliminer des clapiers profonds ou des contours anormaux de la gencive; il faudra s'en tenir à un juste milieu entre le traitement idéal de périodontie et l'intérêt du patient.

LA CARIE DES DENTS PRIMAIRES EN RAPPORT AVEC L'ABSORPTION DE FLUORURE PAR LA MÈRE

J. P. Carlos, A. M. Gippelsohn et W. Haddon Jr. *Pub. Health Rep.* 77:658, 1962.

Les auteurs ont entrepris des recherches sur l'influence de l'ingestion de fluorure par la mère enceinte sur l'incidence de la carie dans les dents primaires des enfants. Ce rapport fournit des renseignements au sujet de 178 enfants qui sont nés avant et après le début de la fluoration de l'eau à Newburg, New York.

Ces constatations portent sur trois groupes d'enfants qui ont tous été examinés à l'âge de six ans. Le groupe A consistait en 57 enfants nés en février, mars et avril 1945, juste avant que la ville de Newburg fluorure l'eau de son aqueduc, le 2 mai 1945. Ce groupe servit de témoin. Les groupes B et C consistaient en 52 et 74 enfants nés dans le même mois, un ou deux ans plus tard, et ayant consommé, depuis leur naissance, de l'eau contenant 1-1.2 ppm de fluorure de sodium, comme l'avaient fait leurs mères au cours de leur grossesse. Seuls des enfants de Newburg prirent part à l'expérience, excepté 9 enfants du groupe A qui étaient de villes environnantes ne disposant pas de fluoration. On a compilé, de 1951-1953, au cours d'une étude complète des effets de la fluoration de l'eau, des statistiques sur l'incidence de la carie dans les dents primaires des enfants des trois groupes. La même personne a fait tous les examens.

Les groupes étaient à peu près tous semblables quant au sexe, la nationalité ou la proportion des enfants de divers districts scolaires.

La moyenne des dents cariées et des dents obturées de ces enfants de six ans était semblable pour les trois groupes. Les résultats ont montré qu'il n'y a pas de rapport significatif entre l'incidence de la carie dentaire dans les dents primaires et l'absorption de fluor par la mère durant sa grossesse.

Des comparaisons établies entre les enfants de six ans nés durant les trois mois qui ont précédé la fluoration à Newburg et ceux nés durant le même mois, un ou deux ans plus tard, n'ont indiqué que peu de différence dans la moyenne des dents cariées et les dents obturées, dans le pourcentage des enfants qui n'avaient aucune carie ou chez ceux qui n'avaient pas de carie dans des types spécifiques de dents.

LA SUSCEPTIBILITÉ À LA CARIE ET LA CONSOMMATION DE PHOSPHATES

A. E. Sobel. *D. Progress* 2:192, 1962.

Des recherches entreprises sur l'effet des composants minéraux de l'alimentation et des fluides de l'organisme sur le tissu minéralisé ont établi l'hypothèse que des diètes riches en phosphates augmentaient la résistance des dents à la carie. Cette hypothèse s'établissait sur le fait que des diètes riches en phosphates diminuaient la quantité de carbonate dans l'émail des dents, lequel carbonate est soluble et plutôt susceptible à la carie dentaire. Des expériences entreprises sur des rats (nourris d'aliments riches en sucre, donc favorisant la carie) ont montré qu'une alimentation riche en phosphates pouvait abaisser de quatre fois l'étendue et le nombre des caries. D'autres expériences

ont montré que des diètes riches en phosphates diminuent la teneur en phosphate du sérum du sang et de la salive et modifient la composition des dents. Le mécanisme du rôle des phosphates dans la diminution de la carie n'est pas encore bien connu; ce rôle peut s'établir par un de ces facteurs ou par une combinaison

de ces facteurs: modification de la composition de la dent, action directe de la salive sur la solubilité des minéraux de la dent, neutralisation des acides des bactéries dans la bouche. Il se peut aussi que le phosphate pourrait s'ajouter au fluor dans l'eau pour prévenir la carie dentaire.

Spécialistes en chirurgie dentaire • Il y a 219 spécialistes dans les trois spécialités reconnues par l'Association dentaire canadienne: 61 en chirurgie buccale, 31 en orthodontie, et 27 en périodontie. Ces trois spécialités sont reconnues dans toutes les provinces, excepté Terre-Neuve. Certaines provinces en reconnaissent d'autres spécialités. — Bureau des recherches économiques de l'A.D.C.

Les buts de l'éducation • "Nous n'aurons au Canada une philosophie de l'éducation que le jour où dans l'esprit d'une saine tolérance, nous travaillerons ensemble à l'unité dans et par la diversité à l'intérieur d'un contexte typiquement canadien, celui d'une dualité de races et de cultures." — Le T.R.P. Henri Légaré.

Adhésion à la Fédération dentaire internationale • Soyez membre supporteur de la Fédération dentaire internationale (1) pour établir des échanges avec des dentistes étrangers; (2) pour vous tenir au courant des progrès de la science dentaire dans le monde entier; (3) pour assister aux congrès annuels et aux réunions spéciales dans des pays étrangers; (4) pour avoir voix dans les délibérations internationales au sujet de votre profession, par le truchement de l'Organisation mondiale de la santé.

Les membres supporteurs de la Fédération dentaire internationale reçoivent, tous les trois mois, le *Journal dentaire international*, le *Bulletin de la F.D.I.*, un certificat et une carte de membre. La cotisation annuelle est de \$15.00 (fonds canadiens); membre à vie: \$200.00. On peut remplir la formule ci-jointe et la faire parvenir avec son chèque ou un mandat-poste au docteur D. W. Gullett, trésorier national de la Fédération, 234 rue St-Georges, Toronto 5, Ont.

Je désire devenir membre supporteur de la F.D.I.

Nom (Lettres carrées) ☐ annuel

Adresse ☐ à vie

.....Signature

L'armée au repos

Pourquoi tenons-nous tant à notre titre de "Docteur" en ci ou en ça? Nous n'oublions jamais de nous sentir supérieurs. En quoi le sommes-nous, si nous ne sommes présents qu'aux manifestations qui ne dépassent pas le niveau du primo vivere? Notre niveau habituel: les biens matériels, maison, voiture, chalet. Notre confort avant tout! Un congrès de temps en temps pour y trouver sans effort une nouvelle technique, un nouveau moyen de conquérir des dollars facilement.

A nos manifestations qui s'occupent d'autre chose que le corps, à nos manifestations artistiques, où sommes-nous? La création musicale ou littéraire, on s'en balance éperdument. La peinture, le théâtre restent en dehors de notre horizon. Au concert, à la bibliothèque, où sommes-nous? C'est déjà presque le repos éternel! Faut-il conclure à notre absence de culture?

Aussi longtemps que nous serons des techniciens et non des hommes, nous ne serons pas les êtres supérieurs que nous croyons être avec beaucoup de satisfaction. Surtout, nous ne rendrons jamais à nos patients les services complets désirables! L'armée au repos, c'est la fin de l'enthousiasme! de l'amour du métier! Celui qui donne le courage de bien faire!

Nous ne changerons pas les simples lois

de la nature. Victor Barbeau écrivait récemment: "De même que nous avons besoin, pour respirer, de grands espaces libres, de lieux plantés d'arbres et de verdure, de même il faut à l'esprit et au cœur des flots de raison, de beauté et de sensibilité pour ne pas croupir dans la banalité et la médiocrité".

Sur tous les autres plans aussi, c'est le repos éternel! Ce monde qui nous peine ou nous réjouit, nous ne le construisons pas. Bientôt, nous aurons raison de le détester. Cependant, nous n'avons pas agi sur le plan social, ni politique, ni éducatif. Le progrès véritable, le bien commun de la société ne peuvent être trouvés que par des esprits clairvoyants et objectifs. Où sont-ils, sinon dans notre élite? Si l'élite est au repos, qui va agir, sinon ceux qui n'y sont pas préparés? Le jour où nos concitoyens nous jugeront tels que nous sommes, c'est déjà commencé, nous aurons perdu leur estime et notre pouvoir de direction. Nous vivrons dans un monde où le spirituel sera absent, un monde où tout est anonyme, des plaisirs aux cerveaux. Nous dégusterons les plats pré-cuisinés offerts par ces supermarchés que sont la presse, la radio et la télévision. Nous aurons laissé se faire un monde rempli de faux bruits et où le bonheur tout court sera encore plus difficile à trouver.

P.C.

Le Canada

NOUVELLE RÉGLEMENTATION POUR LA DISTRIBUTION DES ÉCHANTILLONS

Le gouverneur-général a officiellement sanctionné le bill C.3, loi amendant la loi des aliments et drogues. Le seul changement apporté dans la rédaction originale du bill fut l'addition d'une clause autorisant le gouverneur-en-conseil à formuler des règlements pour la distribution ou pour organiser la distribution d'échantillons de toute drogue. En vertu de cette nouvelle clause, on se propose de recommander au Ministre de la santé nationale et du bien-être social que les règlements au sujet de la nourriture et des drogues soient amendés par l'addition des items suivants:

C.01.048. En vertu de la section C.01.307 et la section G des règlements, une personne peut distribuer un médicament comme échantillon, aux conditions suivantes:

(a) La personne susceptible de recevoir un médicament comme échantillon doit être un médecin, un dentiste, un vétérinaire ou un pharmacien qui est enregistré et habilité à exercer sa profession dans une province du Canada.

(b) La personne distribuant un médicament comme échantillon doit, pour chacun des échantillons distribués, obtenir au préalable une ordonnance écrite signée par le médecin, le dentiste, le vétérinaire ou le pharmacien à qui l'échantillon est distribué et cette ordonnance doit spécifier le nom et la quantité de médicament requis.

(c) La personne distribuant un médicament comme échantillon doit tenir des registres indiquant: (1) le nom, l'adresse et la description de chacune des personnes à qui un échantillon de médicament a été envoyé; (2) le nom, la quantité et la forme du dit médicament; (3) la date où le médicament a été fourni; et la personne distribuant le médicament en échantillon doit

garder les registres et les ordonnances écrites, pour une période de deux ans et permettre l'accès à ces registres au Ministre ou à son représentant officiel, si demande lui en est faite.

C.01.049. Personne ne peut distribuer un médicament en échantillon à moins que ce médicament porte sur une étiquette tous les renseignements requis par ces règlements.

Chronique internationale

XXXVIIes JOURNEES INTERNATIONALES DE PARIS

Le Congrès des XXXVIIes Journées Dentaires Internationales de Paris tiendra ses assises du 25 novembre au 1er décembre 1963, dans le cadre traditionnel de la Maison de la Chimie.

Le Comité d'organisation fera en sorte que dans un climat de chaude amitié se déroulent des séances scientifiques d'une haute valeur, tout en restant dans le domaine pratique. De nombreux conférenciers tant français qu'étrangers ont déjà répondu à son appel.

Une innovation sera apportée cette année. Un certain nombre de confrères universellement connus dans la profession ont bien voulu participer à l'expérience suivante: ils se tiendront pendant une heure à la disposition des confrères inscrits pour ce que le Comité a dénommé les "libres propos" et répondront à toutes les questions qui leur seront posées.

Un programme des festivités sera étudié avec soin afin de permettre à nos confrères français et étrangers de connaître quelques aspects inédits de notre ville et de la culture française.

Le Secrétariat répondra avec plaisir à toutes les demandes et enregistrera toutes les suggestions.

Toute la correspondance doit être adressée au Secrétariat Général: 33 avenue Pierre 1er de Serbie, Paris 16e, France.

KENNEDY ENDOSSE LA FLUORATION AUX ETATS-UNIS

Le président John F. Kennedy, des Etats-Unis, a demandé qu'on approuve "des mesures préventives, telle la fluoration". Le président Kennedy, dans un message publié à l'occasion de la semaine de santé dentaire pour les enfants des Etats-Unis, a déclaré: "J'invite les parents, les dentistes et les organismes de santé à renouveler leurs efforts au cours de cette semaine pour promouvoir la santé dentaire des enfants du pays, en appuyant sur la valeur de l'éducation dentaire et en prônant la valeur de mesures telles que la fluoration de l'eau de consommation. Des gestes du genre feront des enfants plus forts, en meilleure santé et, en fin de compte, une Amérique en meilleure santé."

Le corps dentaire royal canadien

COURS

L'Ecole du Corps dentaire de Camp Borden a donné cet hiver, à l'intention des officiers, deux cours portant sur le soin des blessés et les soins cliniques.

Le premier cours, qui a eu lieu du 21 janvier au 15 février, a été suivi par les officiers suivants: lt.-col. W.W. Anglin, Base de l'A.R.C., Saint-Jean (P.Qué.); lt.col. C.M. Cornish, Q.G. de l'A.R.C., Ottawa (Ont.); major Quince Davis, Corps dentaire de l'Armée américaine; major P.E. Fafard, Fort-Churchill (Man.); major D.E. McDermott, Camp Gagetown (N.-B.); major R.J.K. Pyne, Base de l'A.R.C., Comox (C.-B.), et capitaine W.A. Sugars, Base de l'A.R.C., Saint-Hubert (P.Qué.).

Le deuxième cours, commencé le 4 mars, s'est terminé le 5 avril. Voici quels sont les officiers qui le suivent: major J.D. Bourque, Camp de Valcartier (P.Qué.); major J.C.

Brick, Base de l'A.R.C., Uplands (Ont.); major E.M.C. Franklin, Base de l'A.R.C., Centra-lia (Ont.); major J.I. Gordon, Base de l'A.R.C., Saint-Hubert (P.Qué.); major J. Schnitz, Corps dentaire de l'Armée américaine, et major J. J. Walker, Base de l'A.R.C., Cold-Lake (Alb.).

Le major R.A. Fell, de la base de l'A.R.C. à Goose-Bay (Lab.), suit actuellement le cours de périodontie à la U.S. Naval Dental School de Bethesda (Maryland) qui, commencé le 25 février, s'est terminé le 19 avril.

Le colonel G.B. Shillington, sous-directeur général des Services dentaires, a visité l'Ecole du Corps dentaire à Camp Borden (Ont.) dernièrement, en vue d'accorder des entrevues au personnel suivant des cours et de conférer avec le commandant, le colonel C.E. Purdy. Avant de se rendre à Camp Borden, le colonel Shillington a assisté aux réunions de l'American Denture Society tenues à Chicago du 1er au 5 février.

Le lt-col. D.H. Hillier a représenté le directeur général à la réunion que le bureau de rédaction de la revue *Oral Health* a tenu à Toronto le 6 février.

COURS DE PERFECTIONNEMENT

Le Corps dentaire est en mesure de permettre à ses membres d'améliorer encore leur formation professionnelle grâce à la collaboration du Corps dentaire de la Marine américaine, qui fournit à nos dentistes militaires l'occasion de suivre les cours de perfectionnement que donne la U.S. Naval Dental School de Bethesda (Maryland). Ces cours sont disponibles sur plusieurs matières et consistent en une série de problèmes à résoudre et pour lesquels on fournit aux intéressés tout le matériel de référence nécessaire.

Vingt-six officiers du Corps dentaire suivent actuellement ces cours et trois autres ont déjà obtenu des certificats indiquant qu'ils ont suivi le cours d'endodontie ou de diagnostic buccal.

Voici le nom de ceux qui ont terminé le cours avec succès: capitaine W.E. Gazo, diagnostic buccal; capitaine L.C. Gray, endodontie; et capitaine J.F.A. Marciel, endodontie.

VISITES ET VOYAGES OFFICIELS

Le brigadier K.M. Baird, directeur général des Services dentaires pour les forces armées

du Canada, a commencé en février l'inspection de la 15^e Compagnie dentaire, qui se trouve dans la Région militaire du Québec et dont le quartier général est situé à Montréal. Accompagné du lt.-col. J. G. Butler, commandant de la 15^e Compagnie dentaire, il a visité les cliniques de la ville de Québec, du camp de Valcartier et de la base de l'A.R.C. à Goose-Bay (Lab.).

Les 7 et 8 mars dernier, le brigadier K. M. Baird a accordé des entrevues aux candidats qui suivent des cours à l'Ecole du Corps dentaire. Après avoir passé la fin de semaine au Camp Borden pour prendre part au tournoi mentionné plus haut, il s'est rendu à Montréal pour terminer l'inspection annuelle de la 15^e Compagnie dentaire. Il a visité les cliniques de la région de Montréal en compagnie de l'officier commandant, le lt.-col. J. G. Butler.

Le colonel C. E. Purdy, commandant de l'Ecole du Corps dentaire, a assisté à la réunion annuelle du conseil d'hygiène publique de l'Association dentaire canadienne, tenue à Toronto, les 20 et 21 février dernier. Le colonel Purdy a fait part au Conseil des constatations préliminaires qui sont le fruit de l'étude que poursuit actuellement l'équipe dentaire de la base de l'A.R.C. à Camp Borden. Le but de cette étude, ainsi que les méthodes employées pour la poursuivre, ont fait l'objet d'un article publié dans le numéro d'octobre du *Journal de l'Association dentaire canadienne*.

PRÉSENTATION DU TROPHÉE WANSBROUGH

Le 9 mars dernier, douze équipes se sont mesurées pour le trophée Wansbrough au club de curling de Camp Borden: c'était la première fois qu'avait lieu un tel concours, qui semble bien devoir devenir un événement annuel des mieux réussis. Les unités qui ont pris part à ce tournoi étaient les suivantes: la Direction des services dentaires, d'Ottawa; l'Ecole du Corps dentaire, de Camp

Borden; le 1^{er} Dépôt de matériel dentaire, de Petawawa; la 13^e Compagnie dentaire, de Trenton; la 14^e Compagnie dentaire, de Winnipeg; la 55^e Unité dentaire (Milice), de London. C'est l'équipe du 1^{er} Dépôt de matériel dentaire, dirigée par le sergent d'état-major A. F. Davidson, qui a remporté les honneurs et c'est le brigadier E. M. Wansbrough, O.B.E., M.M., E.D., C.D., donateur du trophée, qui a fait la présentation aux vainqueurs.

Les équipes de l'Ecole du Corps dentaire dirigées par le major J. J. N. Wright et le major P. S. Sills se sont respectivement classées deuxième et troisième, alors que elle du lt.-col. G. E. Windsor, venant de London et représentant la 13^e Compagnie dentaire, a obtenu le prix de consolation. Les présentations ont été faites par le brigadier K.M. Baird, directeur général des Services dentaires des forces armées du Canada.

Les Sociétés dentaires

ABOLITION DE LA CHARTE DE L'ASSOCIATION DES CHIRURGIENS DENTISTES DE LANGUE FRANÇAISE DE L'AMÉRIQUE DU NORD

L'Association des chirurgiens dentistes de langue française de l'Amérique du nord, qui avait été fondée en 1939, a cessé d'exister. Ses directeurs se sont récemment réunis à Montréal pour adopter une résolution priant le Gouvernement de la province de Québec d'abolir sa charte. Cette Association était inactive depuis la dernière Grande Guerre et l'Association dentaire de la province de Québec avait pris la relève.

Hygiénistes en exercice au Canada • Il y avait 88 hygiénistes en exercice au Canada au début de l'année 1963. Leur nombre n'a augmenté que de cinq depuis l'année dernière. — Bureau des recherches économiques de l'A.D.C.

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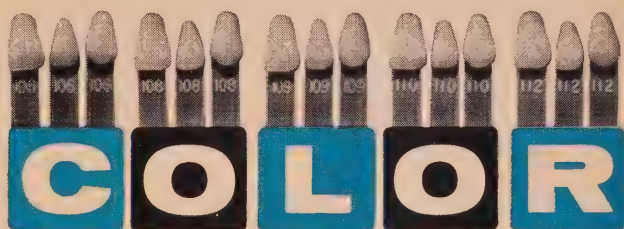
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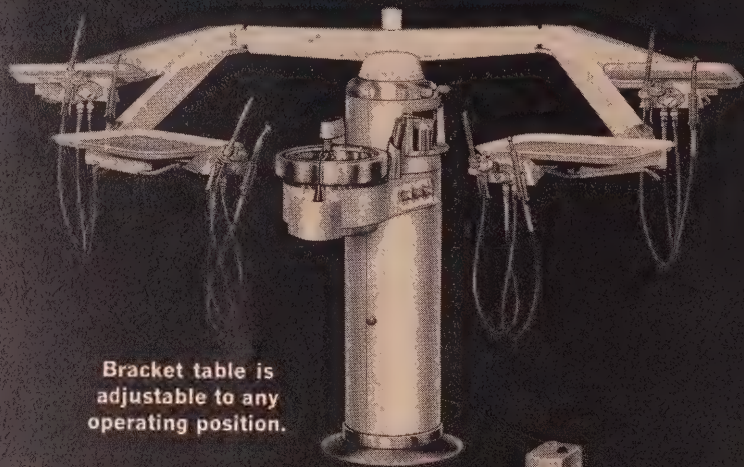
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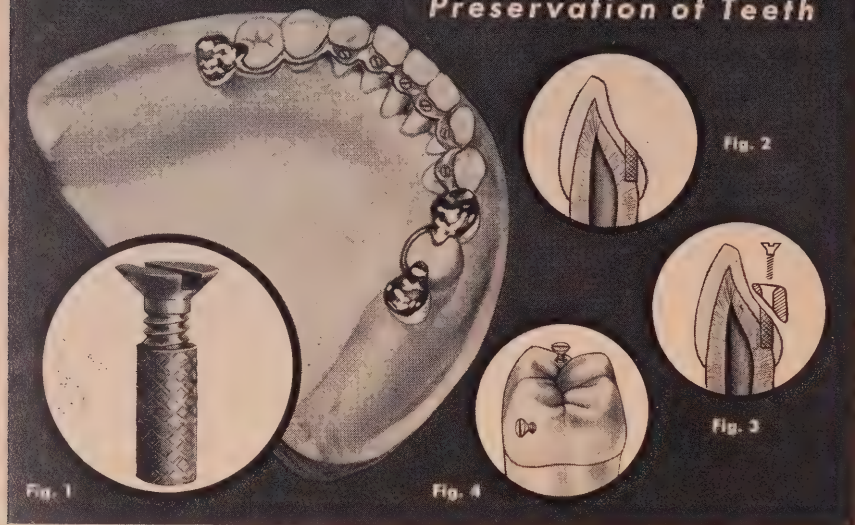
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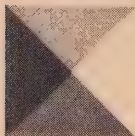
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1. J.A.D.A. 62:466 (April) 1961. 2. J.A.M.A. 180:94 (April) 1962.



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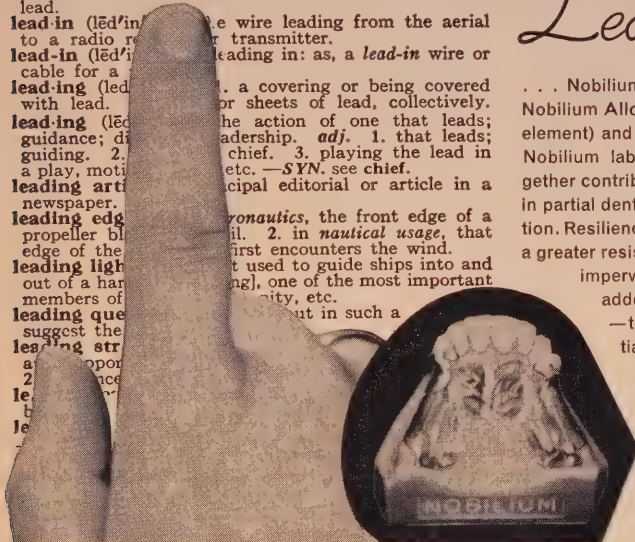
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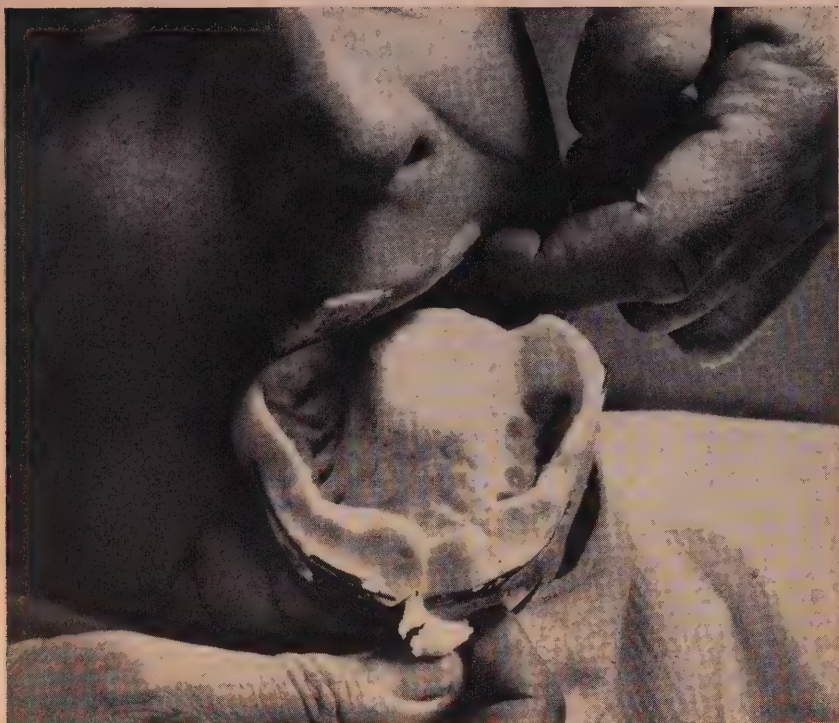
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FOR SALE: Well established practice in London, Ontario, consisting of two fully equipped modern operating rooms. Available now at a most attractive price. Address all enquiries to 451 Regent Street, London, Ont.

FOR SALE: good steady practice in North Western Ontario town of 10,000 with an annual average net income in excess of \$25,000.00 over the past 5 years. Office next to home with four schools within 5 blocks. Real estate valued at \$60,000.00. Excellent fishing and hunting. Will consider low down payment. For additional information and photographs write: C.D.A. Box 301.

FOR RENT — OTTAWA, ONTARIO: Dental Arts Building. Centre of town. Two operating rooms, offices, modern, air-conditioned. Janitor services—parking. Suitable for general practitioners, orthodontist, periodontist. Rent: \$125.00 monthly and up. Apply: 226 O'Connor St., Ottawa. Telephone: CE. 2-0903.

(continued page 36)



SEE HOW THE NEW

Py-co-pay

(TIP AND ALL)

**NOW
FITS
bathroom
fixtures**

*makes proper
home care
easier for patients*

OLD NEW

12 years of research on the profession's 'favorite' toothbrush bring patients these added benefits:

● **Easier to "Hang Up to Dry"**

New Pycopay's streamlined design makes it a simple matter to slip the brush (tip and all) into ordinary bathroom fixtures.

● **Easier to Maneuver**

The new tapered handle and new compact tip make it easier to maneuver Pycopay in the mouth . . . easier to massage "hard-to-get-at" interproximal spaces with the Py-co-TIP.

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Patients are no longer tempted to remove the stimulator tip or ignore your professional recommendations.

NEW PYCOPAY retains the features that have made PYCOPAY recommended by more dentists than any other toothbrush.

BLOCK DRUG CO. (CANADA) LTD. 36 Northline Rd., Toronto 16, Ont.

"Quality Products for Dental Health"

Recommend Dento-fast the modern denture fixative

DENTO-FAST is a powder specially compounded by the makers of DENTO Denture Cleaner for cushioning new dentures on sore gums and for overcoming shrinkage difficulties after recent extractions. You can confidently recommend DENTO-FAST for keeping dentures firmly in place.



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Omnilfil complies with A.D.A. Specifications and has been thoroughly tested, both clinically and in the dental office. It has a history of 6 years of successful use in Europe and elsewhere. Now in its 4th year in Canada, Omnilfil has gained wide acceptance.

You can order Omnilfil today from your salesman or by mail as below.

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Send without delay:

- ☐ Omnilfil regular kit powder & liquid at \$5.00
☐ Omnilfil large kit powder & liquid at \$12.00

(Please print name and address)

FOR SALE — GOOD PRACTICE: in lovely Niagara Peninsula, Ontario. Modern office suite, reasonable rent, parking facilities. For more information, apply to: C.D.A. Box 325.

FOR SALE—DENTIST'S HOME: well equipped office attached. Attractive, well built, modern seven room house. One acre lot, nicely landscaped, on main highway, six miles from London, Ontario. Inquire: Box 119, Lambeth, Ontario.

FOR SALE—PRACTICE AND EQUIPMENT: The practice and equipment of the late Dr. Kenneth Blancher in Morrisburg, Ontario (The St. Lawrence Seaway Area), is for sale. Purchaser may rent office and waiting room from Estate. X-Ray, Webber Unit and Air Turbine, sterilizer, and normal equipment and supplies. Excellent opportunity. Price and terms may be negotiated. Write or call: C. F. McInnis, Solicitor, Box 202, Morrisburg, Ontario. Telephone: KI: 3-3061.

FOR SALE: Well established practice in a town in beautiful Muskoka, Ontario. All or part of modern equipment for sale. Present owner would exchange for practice in Etobicoke area. Apply: C.D.A. Box 329.

FOR SALE: Dental practice in Calgary, Alberta. Monthly payments. Good business. Well located. Apply: C.D.A. Box 330.

FOR SALE: In west suburban Toronto, Ontario (Etobicoke, Ont.), active three year old dental practice. Large recall practice. Prosthetics (Comp. and Part. Dentures, Cr. and Br. rehabilitation); Oper. Dent.; Oral Surg.; Endodontics; Preventive and some Corr. Orthodontics, etc. Two fully equipped operatories with latest equipment, built in cabinets, lab., X-ray dark room, storage area, private office for consultations and case presentation, reception room. Located in modern Medical Center and shopping plaza. Steadily increasing income — gross 1961 \$29,000, 1962 exceeding \$30,000. Leaving for post graduate studies. Contact: C.D.A. Box 331.

PRACTICE FOR SALE, TORONTO, ONT.: Opportunity for dentist to associate in modern, fully equipped, recently established office in Forest Hill area, with option to buy. I will be away on course. Contact: Dr. J. S. Smith at 533½ Eglinton Ave. West, Toronto 12, Ont. Telephone: 489-2241.

ESTABLISHED PRACTICE AVAILABLE: Dr. F. W. Doan is retiring from his practice in the Medical Arts Building, Toronto, Ontario due to ill health. The office provides fully equipped operating rooms, S. S. White Borden Air Rotor, X-ray equipment, lab., and newly decorated reception room. The gross is \$33,000 per year. Flexible terms may be arranged. The Medical Arts Building, centrally located at Bloor and St. George Sts., is easily accessible to the new subway, and provides parking. Please address inquiries to: Mr. Andrew S. Mathers, Mathers & Haldenby Architects, 10 St. Mary Street, Toronto, Ont. Telephone: WA: 4-9201.

FOR SALE: 15 year old practice in Saint John, New Brunswick. Reasonable terms. House can also be bought if so desired. Apply: Dr. A. Steuermann, 115 Union St., Saint John, N.B.

FOR SALE: Office in downtown location in Edmonton, Alberta. Write: C.D.A. Box 332.

FOR RENT, CALGARY, ALBERTA: 900 sq. ft. available in this bright, modern air conditioned building. Space already partitioned. Plenty of parking available. Located in the Condon block on the corner of 17th Ave., and 14th St., S.W. A busy shopping district, serviced by several bus lines. An excellent opportunity for dental practice. Rent concessions to one full year of the lease. For further information contact: Clair J. Cote, 628 - 12th Ave., S.W., Calgary, Alberta.

(Continued page 38)

THE UNIVERSITY OF ALBERTA FACULTY OF DENTISTRY

OPPORTUNITIES FOR GRADUATE STUDY AND RESEARCH IN DENTAL SCIENCES

Appointments are now available in the Faculty of Dentistry, University of Alberta, for dental graduates who are interested in research and graduate study.

Candidates who are accepted for admission to the Faculty of Graduate Studies may prepare for the M.Sc. degree. The active research interests of the staff include: — Anatomy, Biochemistry, Dental Materials, Microbiology, Dental Public Health and Epidemiology, and Pediatric dentistry including interceptive orthodontics and treatment for handicapped children.

In addition, programs leading to the M.Sc. and Ph.D. can be arranged in various basic science departments.

Fellowships and assistantships are available. Applications may be submitted at any time throughout the year.

For detailed information, write to:

The Chairman,
Committee on Graduate Studies,
Faculty of Dentistry,
University of Alberta,
EDMONTON, ALBERTA, CANADA.

THE DEPARTMENT OF NATIONAL HEALTH AND WELFARE

AT OTTAWA

requires

CHIEF, DENTAL HEALTH DIVISION

\$13,300 - \$14,200

and

PUBLIC HEALTH DENTAL OFFICER

\$10,400 - \$11,800

The Chief, Dental Health Division, in co-operation with provincial agencies and interested organizations, is responsible for the development and promotion of a national program directed toward the improvement of dental health in Canada. The Public Health Dental Officer assists in this program.

At least one year of post-graduate study in a related field and a number of years of experience in public health practice are required.

For further details and application forms, write IMMEDIATELY to the CIVIL SERVICE COMMISSION OF CANADA, OTTAWA 4. Ask for Information Circular 63-588.

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WILLROY MINES LIMITED
Manitouwadge, Ontario**HYGIENIST REQUIRED:** by a group of five
dentists in modern dental clinic in Halifax,
Nova Scotia. A varied type of practice is
assured. Group includes one orthodontist, and
one dentist limited to the practice of chil-
dren's dentistry. Starting salary commensurate
with experience. For information write: C.D.A.
Box 320.**FOR SALE OR RENT:** Excellent location in
heart of Montreal, Quebec, crescent street.
Lucrative dental practice, fully equipped, for
October first or sooner. Apply to: 492 Wood
Ave., Westmount, Montreal. Telephone: WE:
5-9723.**FOR SUBLET:** Dental office — 375 sq. ft. —
separate waiting room, consulting office. 9' x
11 ft. operatory, lab., dark room. Built and
furnished from Sept. 1959 — removing equip-
ment to larger premises — will sell built-in
cabinets, furniture, etc. Available May 1, 1964.
Terms of purchase can be arranged. Profes-
sional Centre Building, 5757 Decelles Ave.,
Suite 446, Montreal 26, Quebec.**DENTIST WANTED:** To take over a busy prac-
tice while owner takes post graduate work.
The practice is located in west Toronto, Ont.
A dentist is needed from August, 1963 for
approximately one year. Please address in-
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Brantford, Ontario. Salary \$100 weekly to
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Box 334.**OPPORTUNITIES AVAILABLE****ONE OR TWO DENTISTS WANTED:** to join a
modern Toronto, Ont. medical clinic. Two
modern, fully equipped operatories and labs.
Several thousand patients' charts and busy
practice guaranteed from the start. Apply,
giving all pertinent information to C.D.A.
Box 321.**DENTIST WANTED:** to associate with practi-
tioner in Alberta's capital city. Good working
facilities available and working arrangement.
Apply: C.D.A. Box 305.**OPPORTUNITIES WANTED****DENTIST:** Age 29, with 5 years of general prac-
tice experience desires association with practi-
tioner in British Columbia. Trained and ex-
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Fluothane and Trimar. Option to purchase or
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Citanest[®] HCl

A new short acting analogue of Xylocaine[®]

Citanest HCl gives the same rapid, safe, profound and predictable anesthesia as does Xylocaine. The only practical difference between these anesthetic agents is the duration of pulp and soft tissue anesthesia when administered by infiltration technique.

Select the anesthetic to match patient chair time for a wider range of anesthetic control. Patient chair time is based on duration of pulp anesthesia.

Anesthetic	(1)	Patient Chair Time	Average Duration of Soft Tissue Anesthesia
Citanest HCl 4% without epinephrine Color Code: Black		Up to 15 Minutes	90 Minutes
Citanest HCl 3% with epinephrine 1 : 300,000 Color Code: White	(2)	Up to 30 Minutes	120 Minutes
Xylocaine HCl 2% with epinephrine 1 : 100,000 Color Code: Red		Up to 60 Minutes	180 Minutes
Xylocaine HCl 2% with epinephrine 1 : 50,000 Color Code: Green	(3)	Up to 60 Minutes	210 Minutes

- (1.) Citanest HCl 4% (Black) should be used whenever vasoconstrictors are clearly contraindicated.
(2.) Limited to chair time not exceeding 30 minutes.

- (3.) Xylocaine HCl 2% (Green) with epinephrine 1:50,000 should be used whenever pronounced hemostasis is desired.

When administered for mandibular block, the effectiveness and duration of anesthesia for Citanest HCl and Xylocaine HCl are the same.

If only one anesthetic is desired in every day practice, then Xylocaine HCl 2% (Red) is recommended to assure your patient adequate duration of pulp anesthesia and freedom from pain regardless of chair time.

Detailed information available on request.

Citanest[®] HCl

For chair time up to 30 minutes

Xylocaine[®] HCl

For chair time up to 60 minutes

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